

"The Future is Faster than you Think"

***How Converging Technologies Are Allowing
Business to Accelerate, Thrive and Advance.***

Live Tweeting?

I'm @PeterDiamandis



Peter H. Diamandis, MD

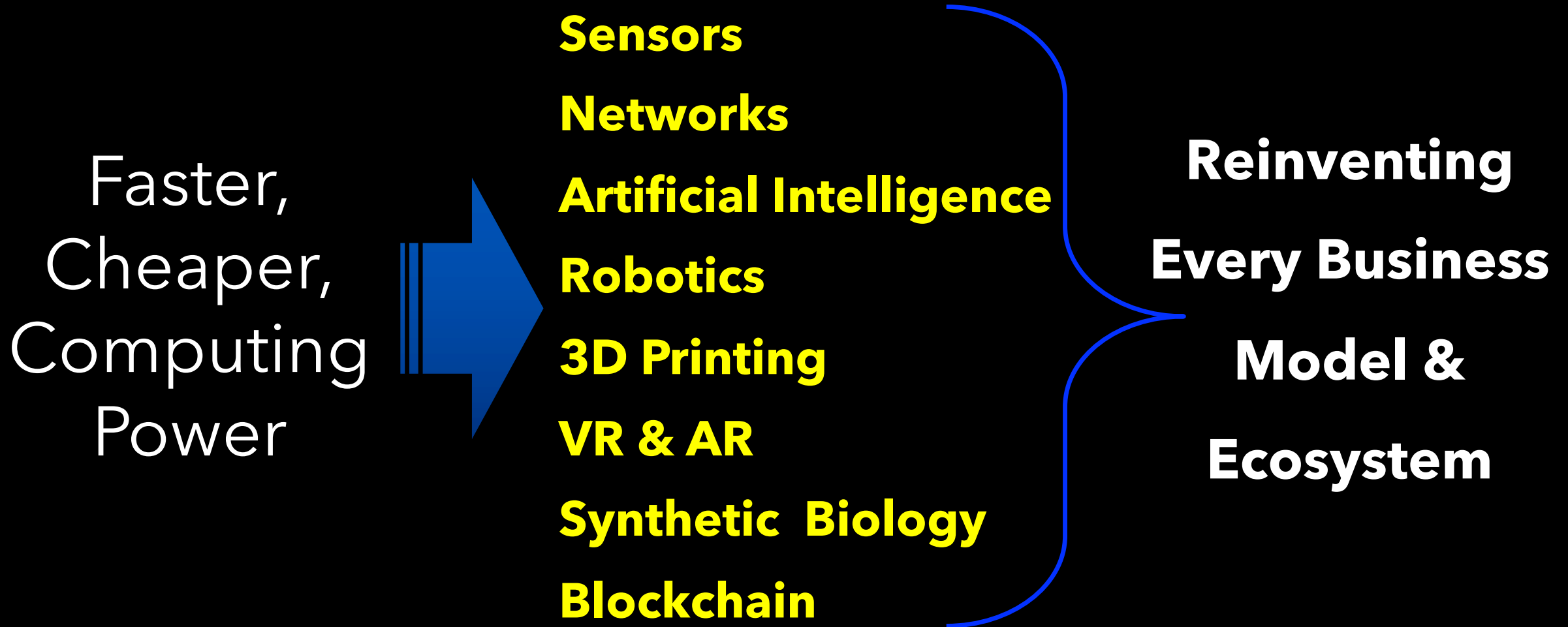
**Human development over
150,000+ years...**

Local + Linear

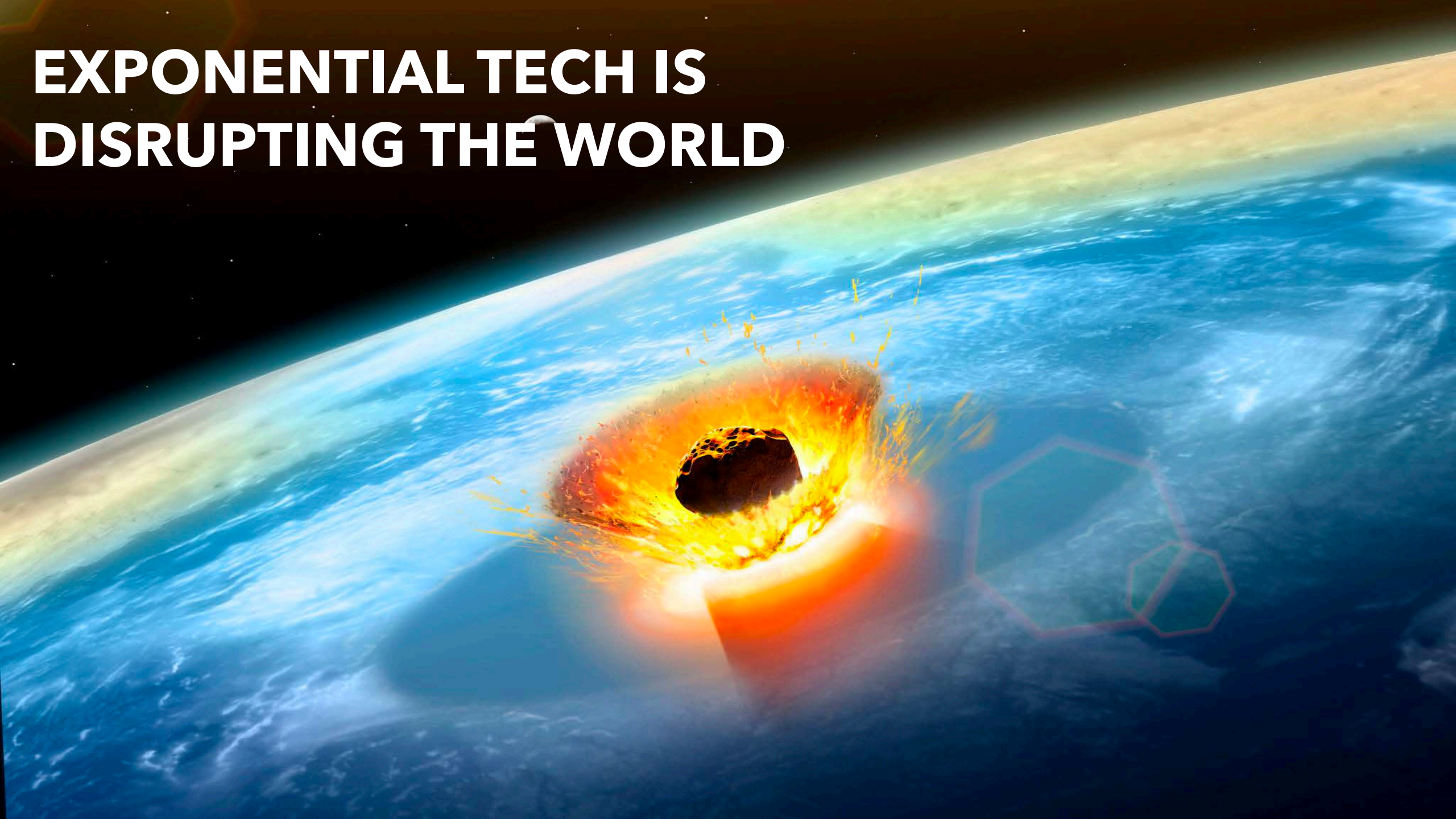
Human development over **150,000+ years...**

GLOBAL + EXPONENTIAL

CONVERGING EXPONENTIAL TECH



EXPONENTIAL TECH IS DISRUPTING THE WORLD





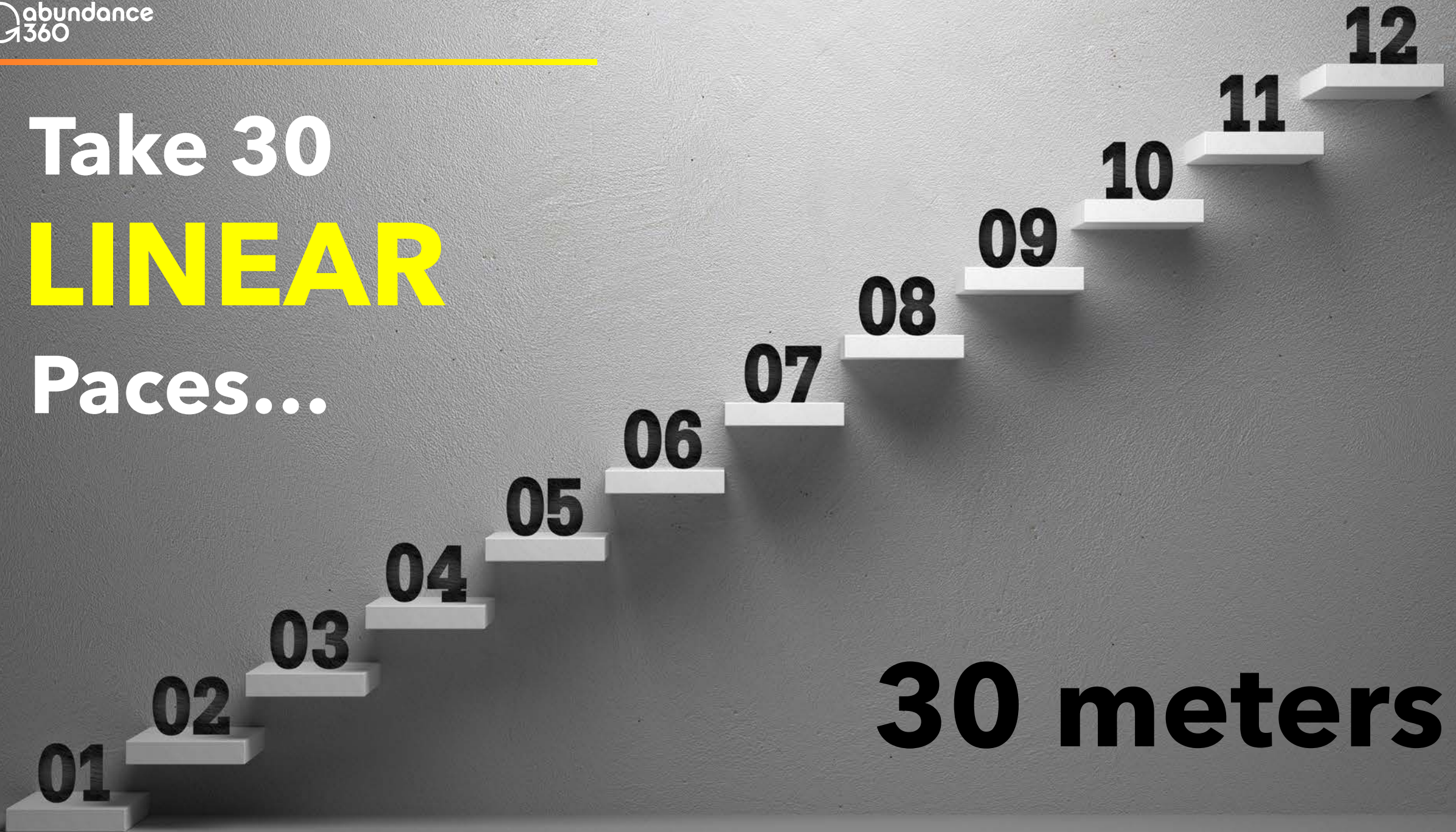
**SARS-CoV2 IS ANOTHER DISRUPTIVE
ASTEROID STRIKE...**



A low-angle, upward-looking perspective of several modern skyscrapers with glass facades, creating a sense of height and scale. The buildings are arranged in a way that they seem to converge towards the top of the frame.

What does
EXPONENTIAL
growth feel like?

Take 30
LINEAR
Paces...



30 meters

Take 30 **EXPONENTIAL** Steps...

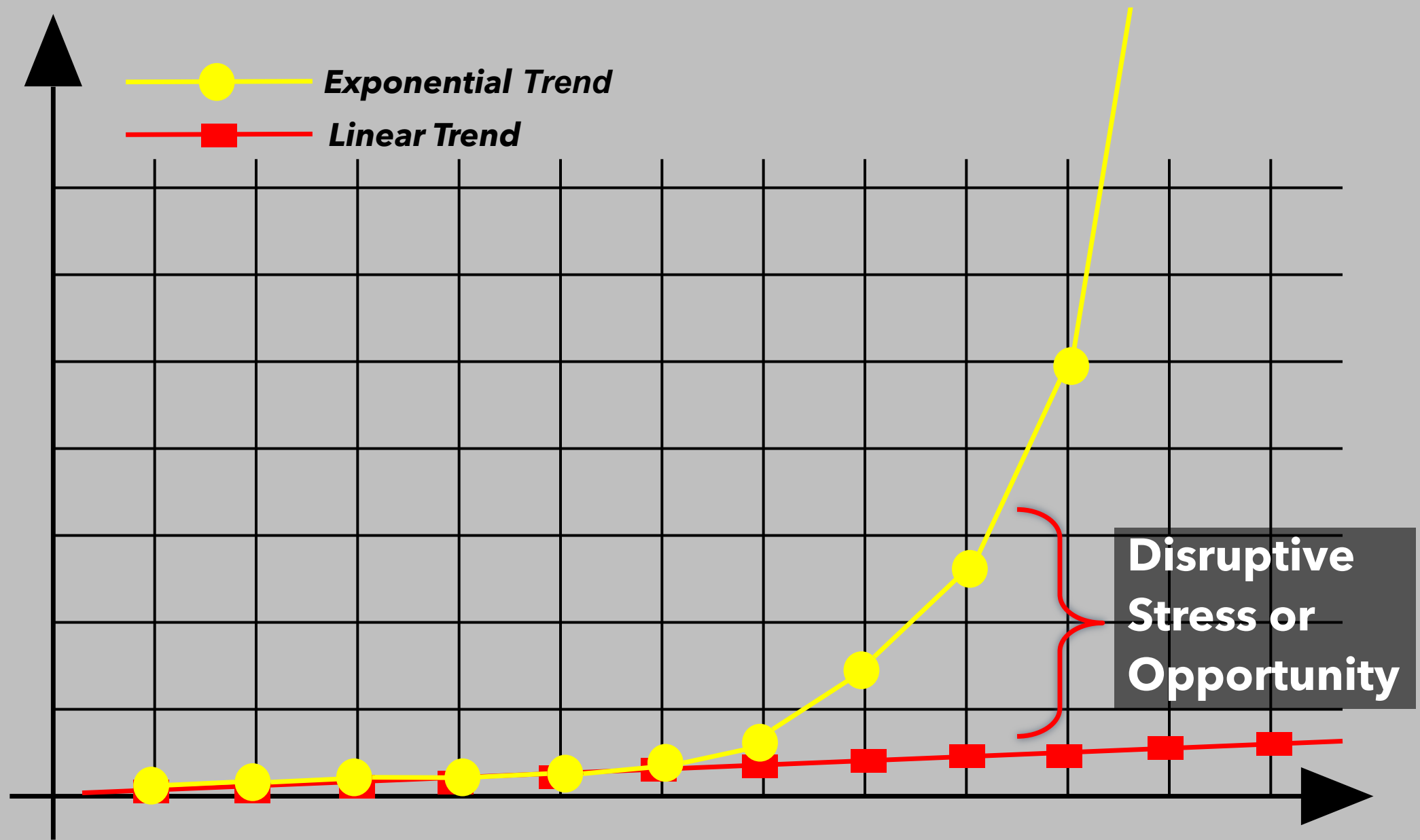
01 02 04 08 16 32 64 128 256

1,073,741,824 meters!

26X

around the Earth!





LINEAR → EXPONENTIAL



1996

MarketCap: \$28B
Employees: 140,000



2012

Bankrupt
Employees: 17,000



April 2012

MarketCap: \$1B
Employees: 13



\$100 BILLION

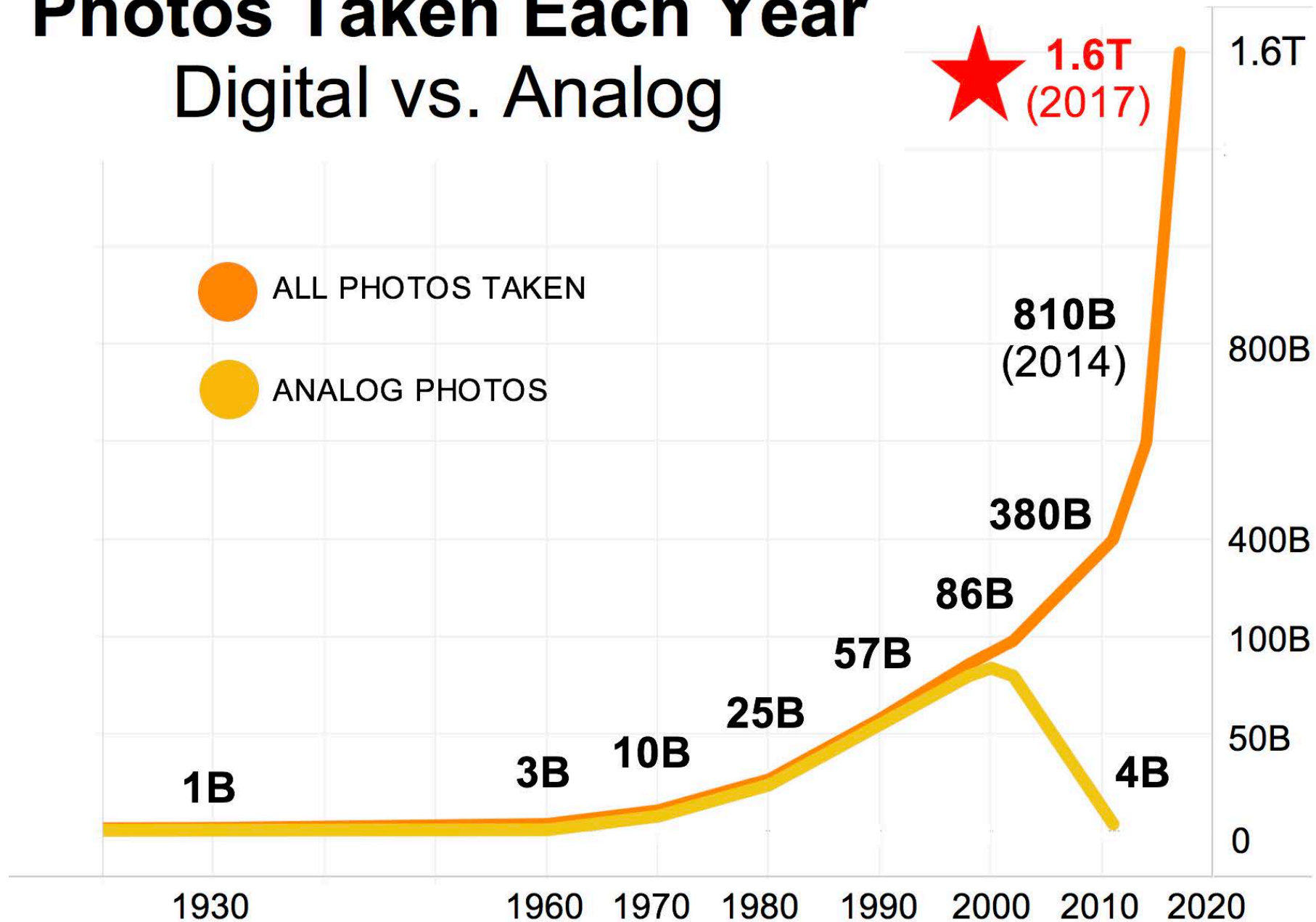
1 BILLION



**INSTAGRAM VALUE SKYROCKETS TO OVER
\$100 BILLION, REACHING 1 BILLION
MONTHLY ACTIVE USERS IN JUNE 2018**

Photos Taken Each Year

Digital vs. Analog



"I've got an Idea!"

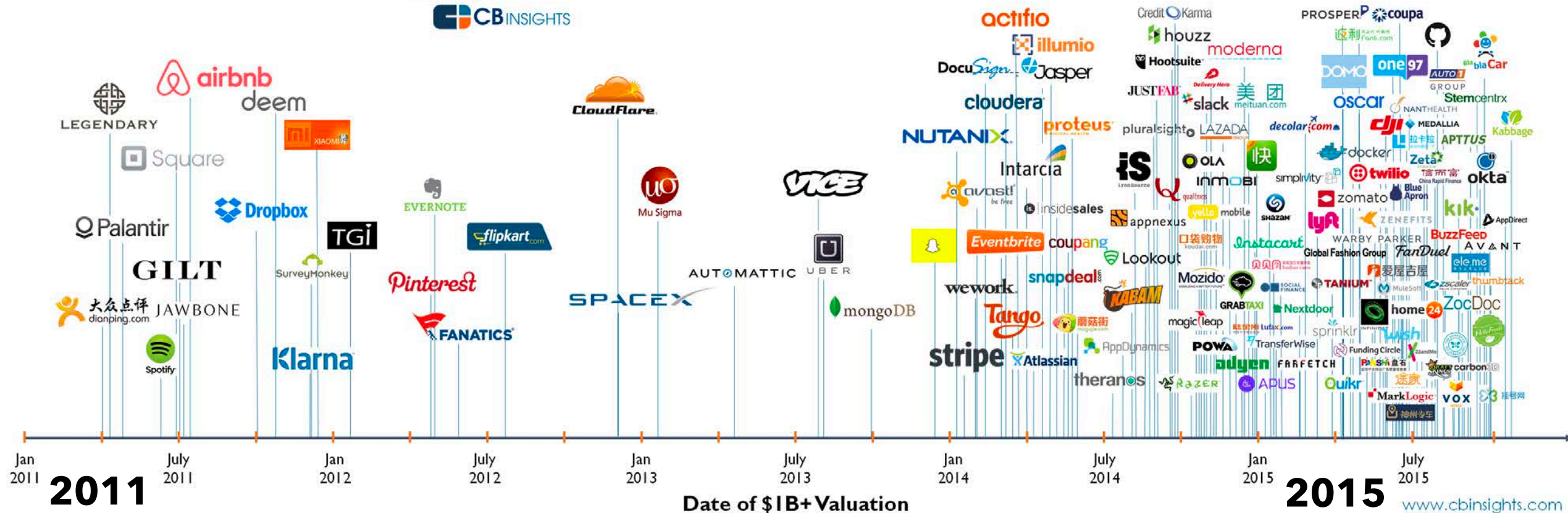
→ "I run a \$Billion company."

The Increasingly Crowded Unicorn Club

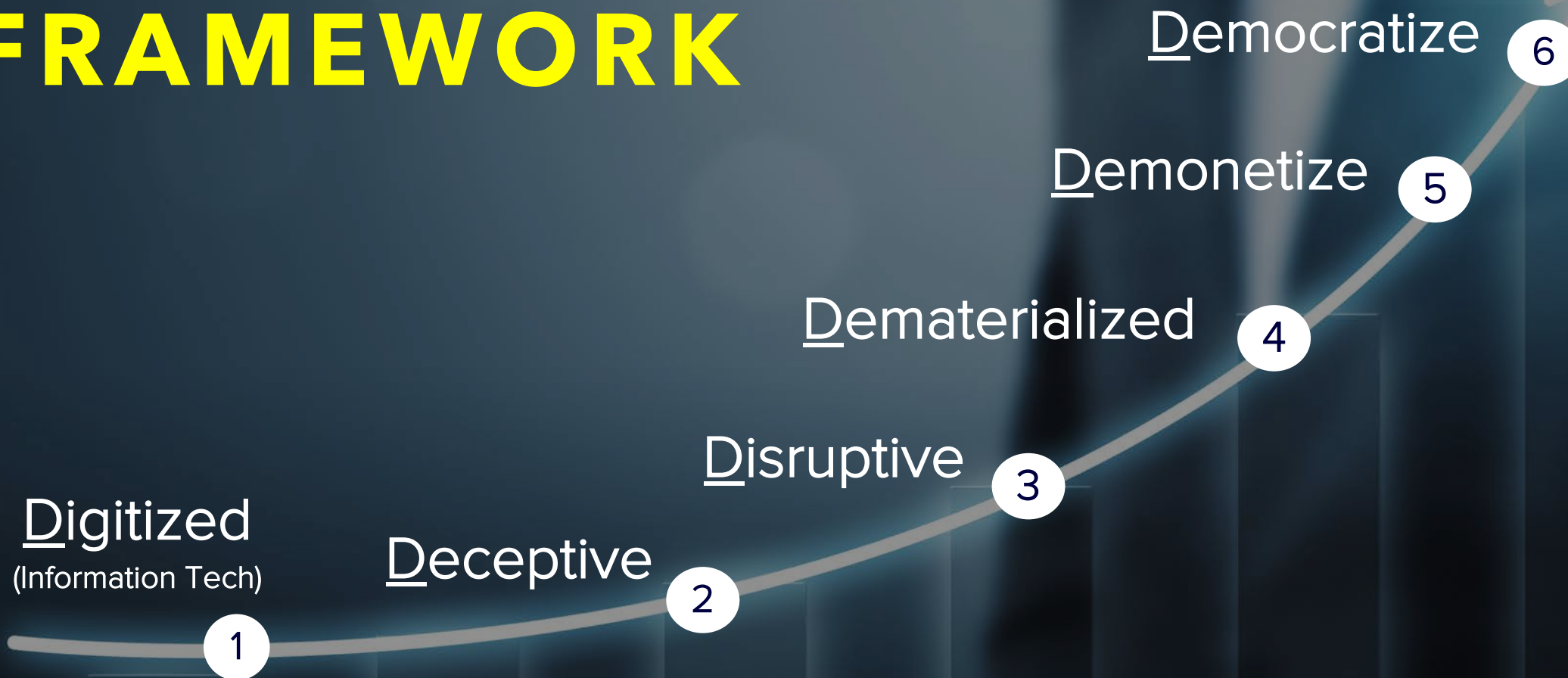
Created by:



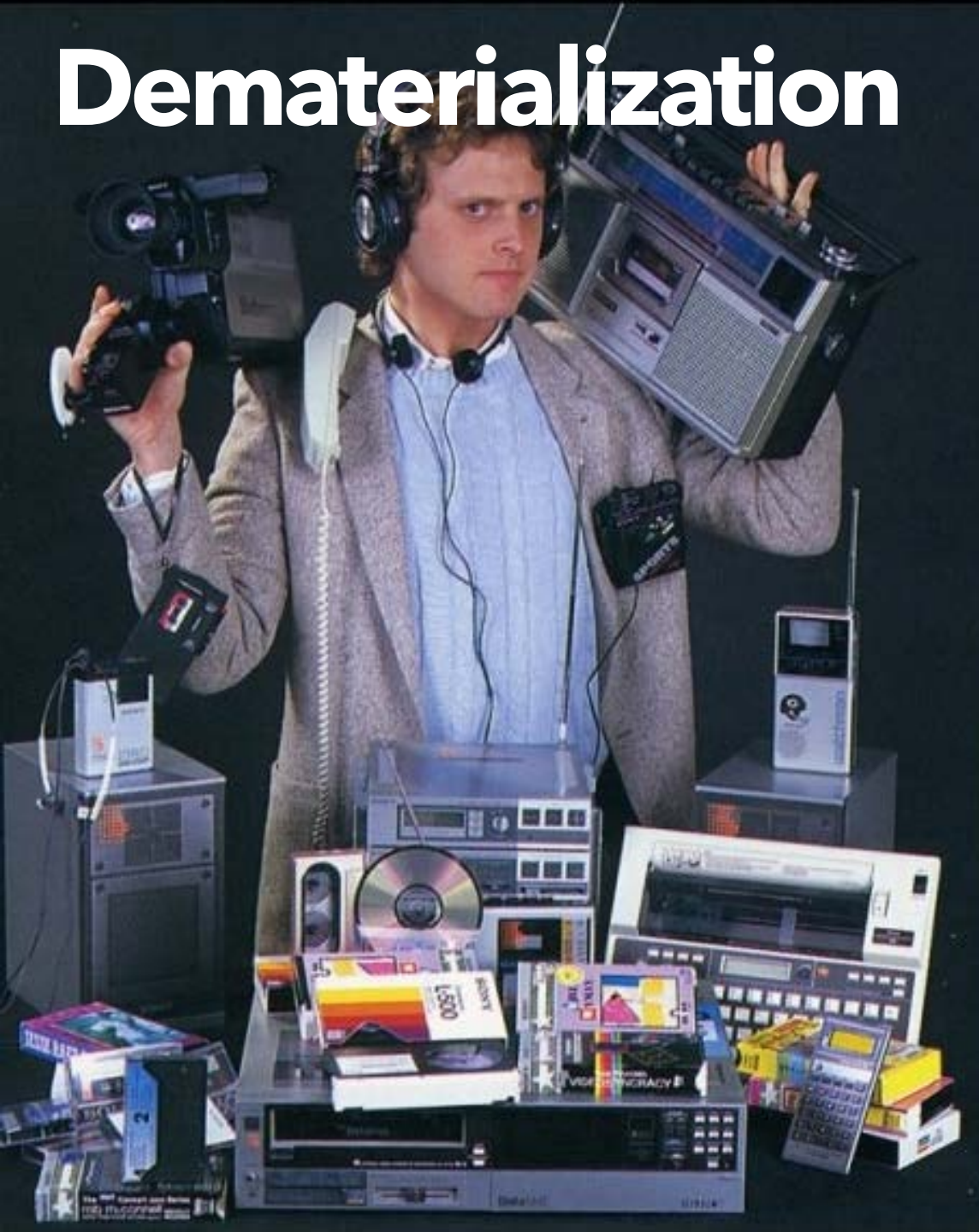
Private Unicorns since 2011



6D's EXPONENTIAL FRAMEWORK



Dematerialization



**20 Years Later,
All of These Fit in
Your Pocket**



Demonetization



~~Taxi Fleets~~



~~Book Stores~~



~~Long Distance~~



~~Research/Libraries~~



~~Classifieds~~

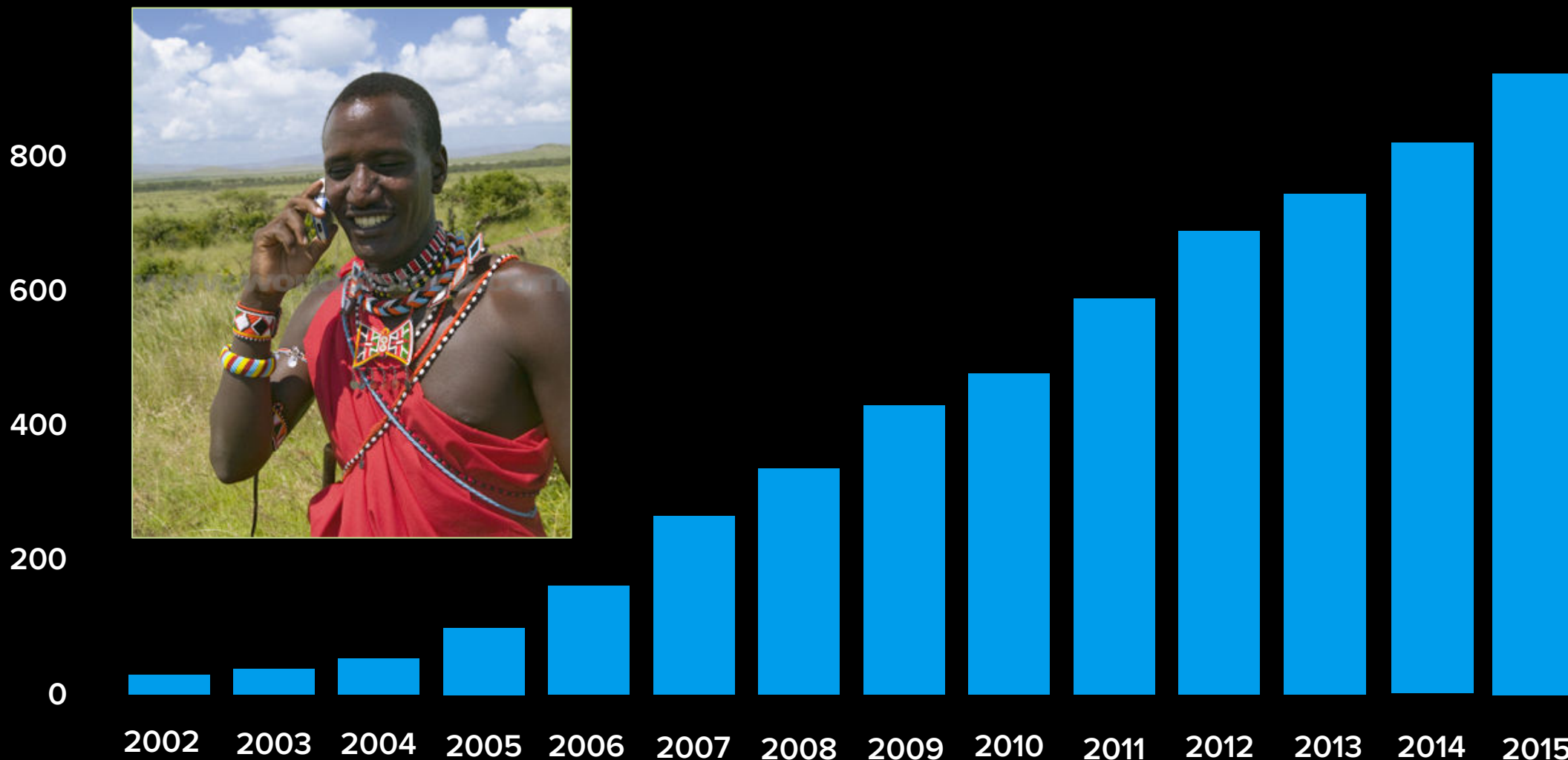


~~Hotel Chains~~

Democratization

African Mobile Phone Growth: > 1 B in 2017

Number of Mobile Handsets (Millions)



What's Driving **EXPONENTIAL TECHNOLOGICAL** growth?

What's Driving This?



1965 Publication:
Moore's Law: "Number of transistors doubled every year from 1958 until 1965... and it's likely to continue."

... and it's continued for 50+ years.

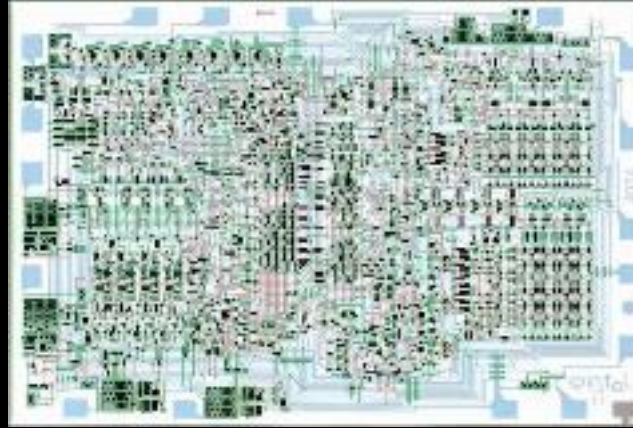
Integrated Circuits

1958: 2 Transistors



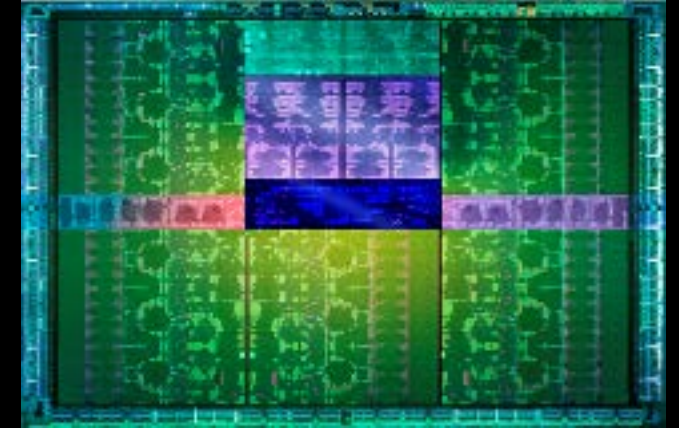
Transistor Count: 2
Gate Process Length: 1/2 inch
Speed:
Cost of a Transistor:

1971: Intel 4004



2,300 Transistors
10,000 Nanometers
740 KHz (.00074 GHz)
≈ \$1 (1968)

2018: Intel Core i9-8950HK



> 7 Billion Transistors*
14 Nanometers
4.80 GHz
≈ \$. 00000024

← 6.5K (faster) & 4.2M (cheaper) →
27+ Billion-fold improvement (47 yrs.)



1956

5 Mbytes - \$120,000

2005



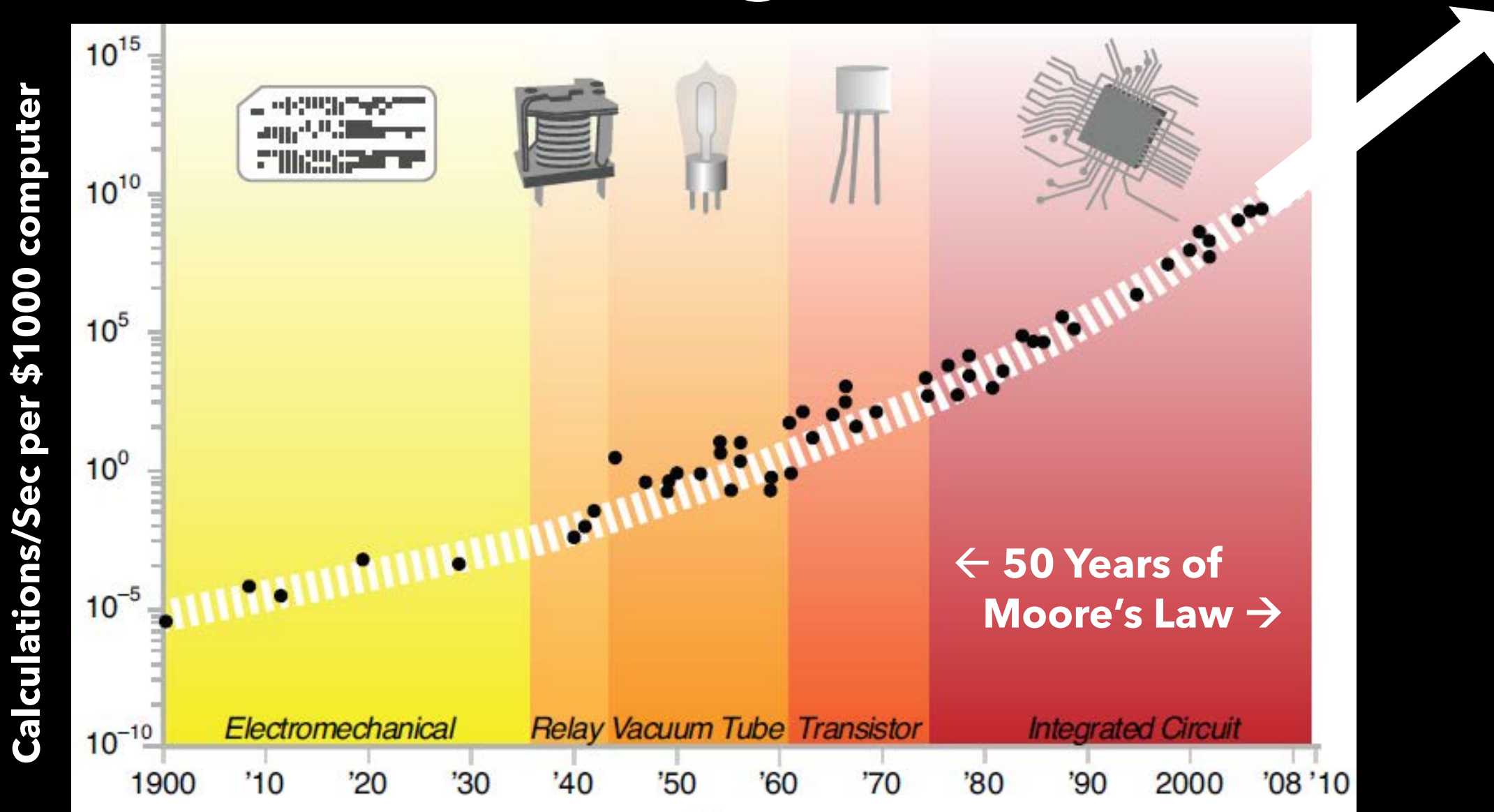
128 Mbytes - \$99



128 Gbytes - \$99

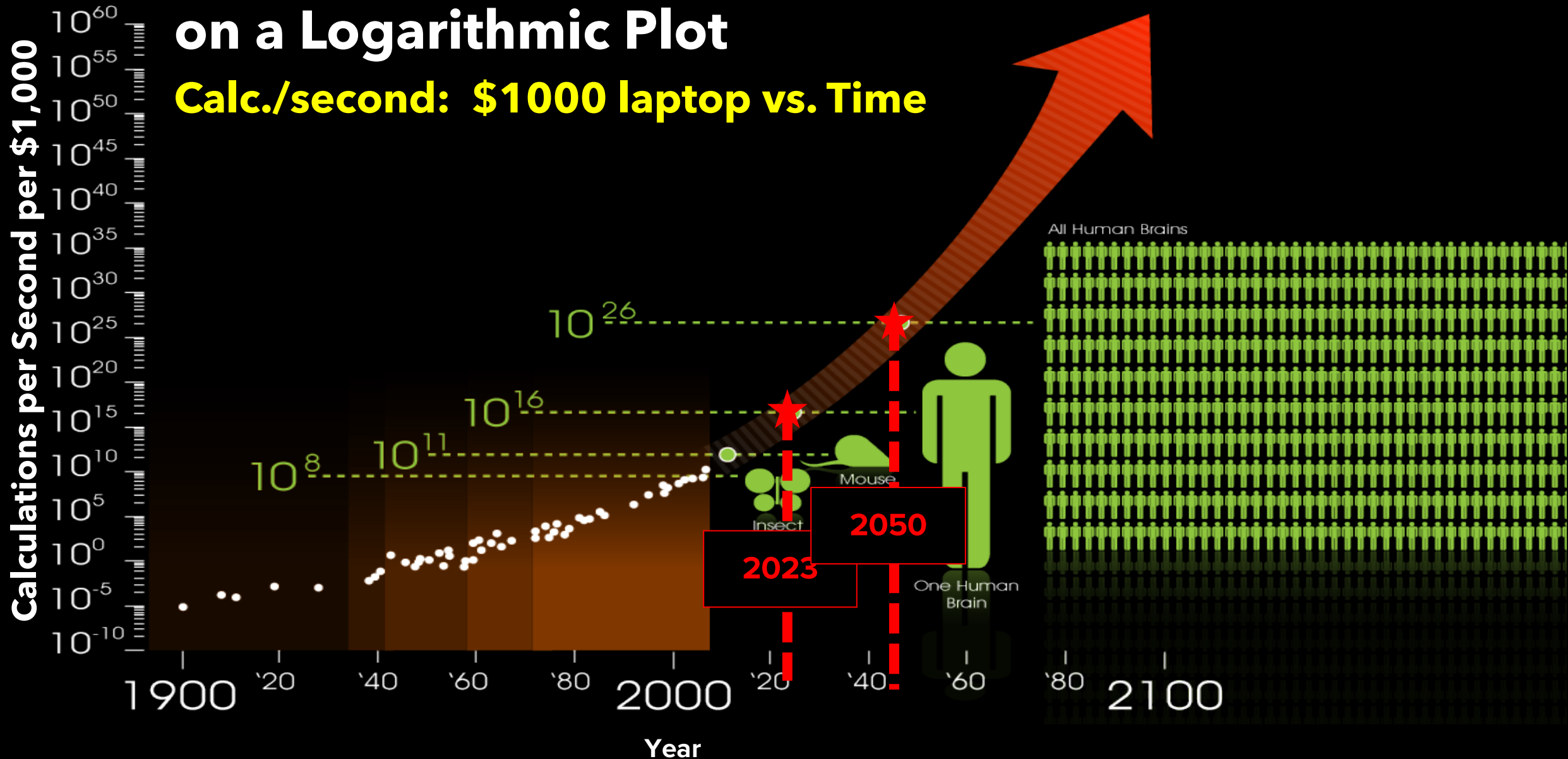
← A 10 Trillion-fold Improvement →

Law of Accelerating Returns



The exponential growth of computing on a Logarithmic Plot

Calc./second: \$1000 laptop vs. Time



TECHNOLOGY CONVERTS
"Scarcity" into "Abundance"



**Designed By Jony Ive
& Marc Newson**

CREATING ABUNDANCE

What do you think of as scarce?

1. Energy

2. Water

3. Health

4. Learning

5. Time

6. Money

7. Resources

8. Food



META-TREND

"ENERGY ABUNDANCE"

***6,000x MORE SOLAR HITS THE EARTH'S
SURFACE THAN WE CONSUME/YEAR.***

ENERGY PRICES



Price of Coal:
5-6 cents / kwh



All-Time LOW Cost
For SOLAR ENERGY

Abu Dhabi (2017): 2.4 CENTS / KWH



Chile: 2.15 CENTS / KWH

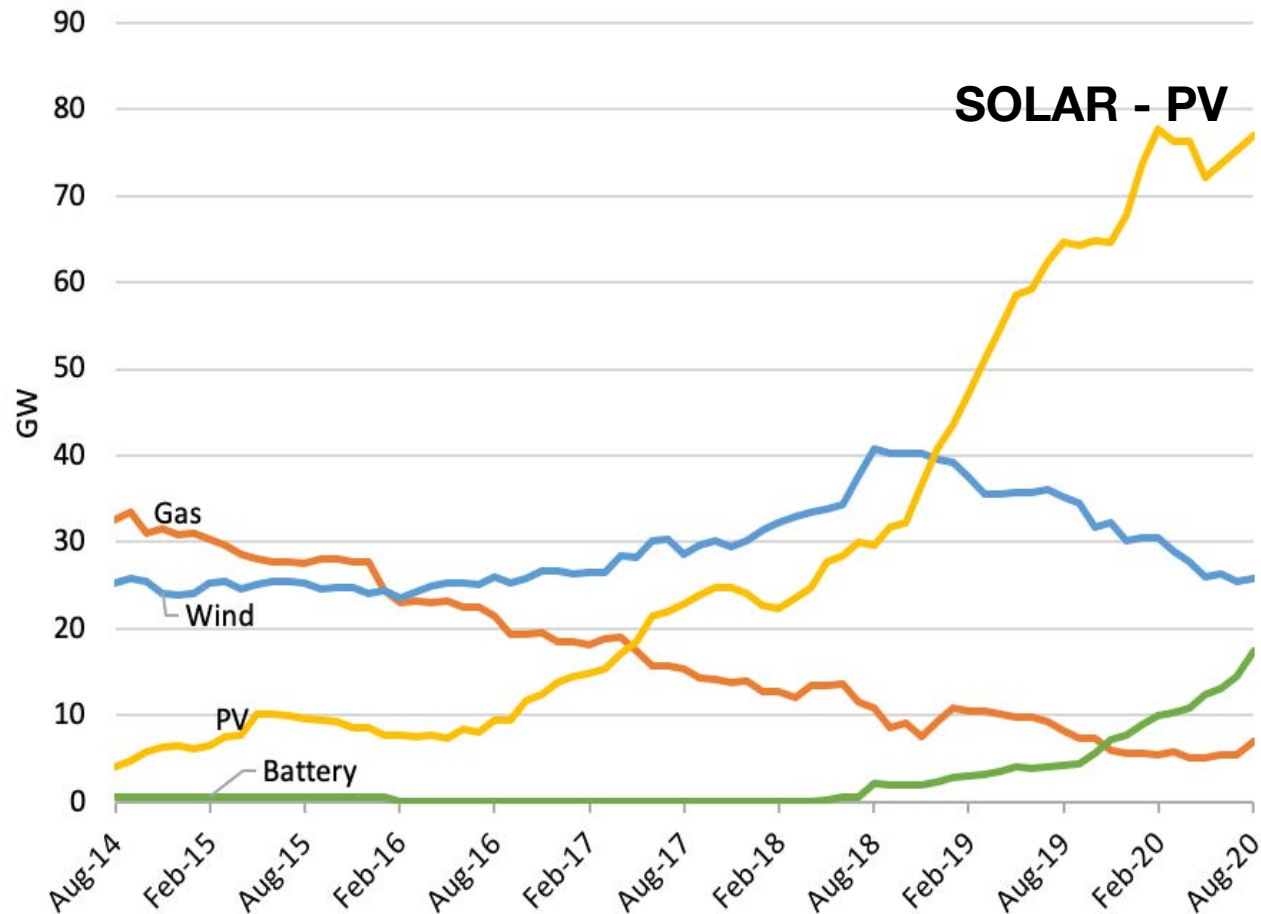
Mexico: 2.0 CENTS / KWH

Brazil (2019): 1.75 CENTS / KWH



RENEWABLES KICKING NATURAL GAS TO THE CURB

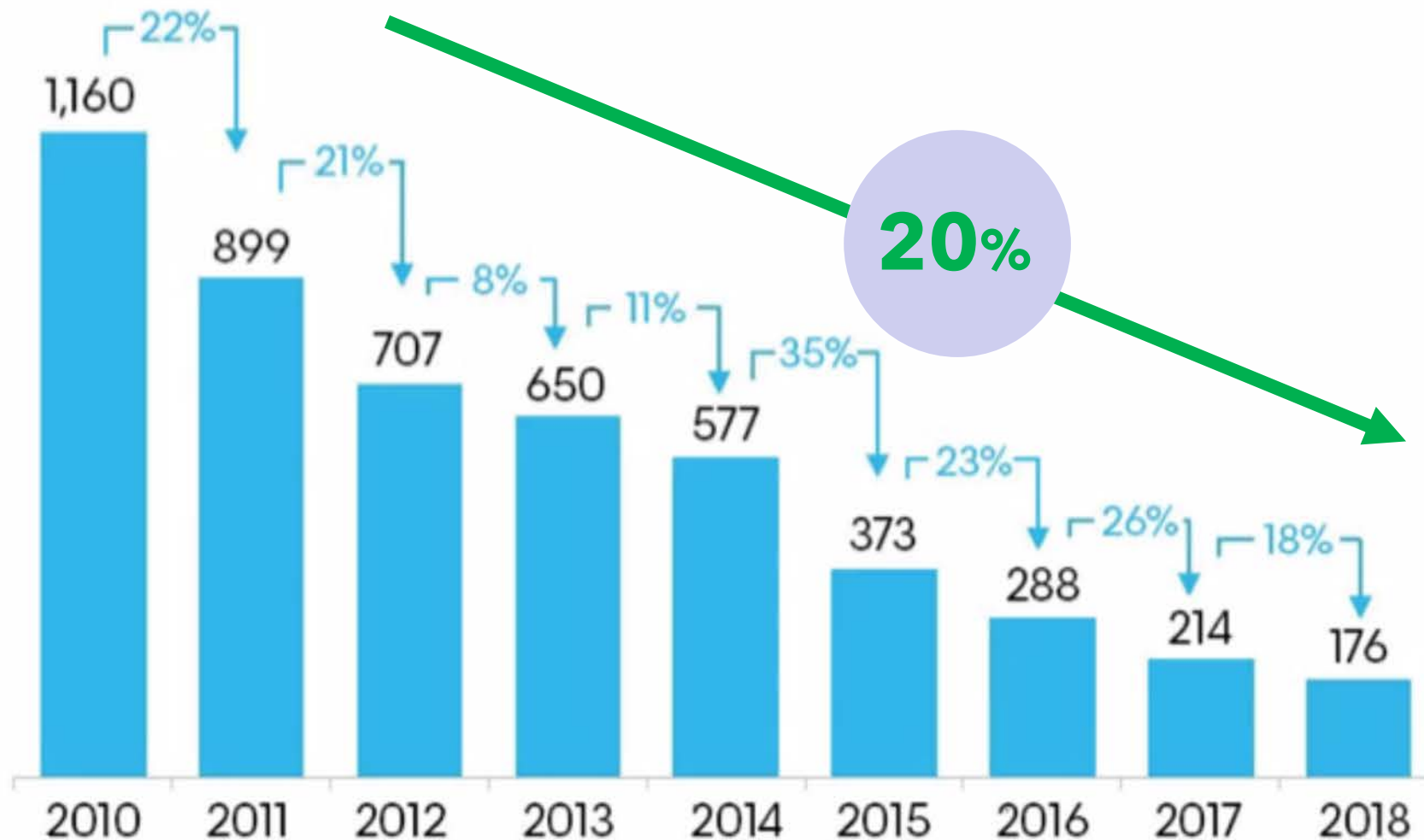
Monthly Capacity in ERCOT Queue by Resource Type



- Renewables win **95% of the time** in head-to-heads against thermal generation
- Since 2018, 2X new renewable projects.
- Since 2018, **\$30 billion worth of gas projects** have been canceled or abandoned

LITHIUM-ION BATTERY PRICE (\$/KWH) (2010-2018)

Battery pack price (real 2018 \$/kWh)



BloombergNEF. Note: The data in this chart has been adjusted to be in real 2018 dollars.

TESLA PLANNING 10-12 GIGAFACTORIES, WORLDWIDE

An aerial photograph of a large industrial facility, identified as a Tesla Gigafactory. The building has a vast, flat roof covered in blue solar panels. To the right of the main building is a smaller, multi-story structure. In the background, a rugged, hilly landscape is dotted with numerous white wind turbines, suggesting a focus on renewable energy. The sky is overcast.

GIGAFACTORY 1 (Reno): HIGHEST VOLUME BATTERY PLANT IN THE WORLD

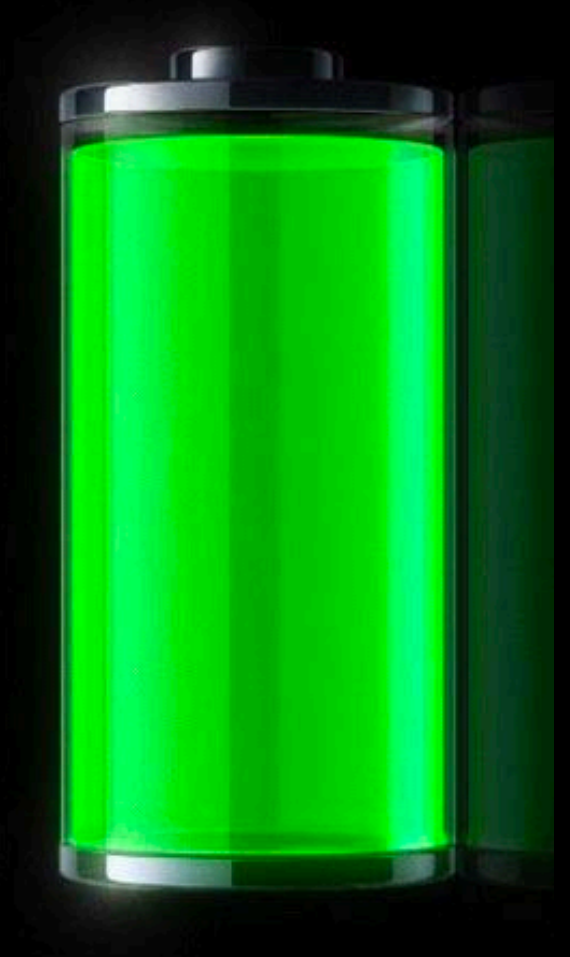
GIGAFACTORY 2 (Buffalo NY): 1st FULL YEAR - SOLAR ROOF TILE PRODUCTION

GIGAFACTORY 3 (Shanghai): BREAKS GROUND/MODEL 3 & Y FOR CHINA

GIGAFACTORY 4 (Europe): LOCATION CHOSEN IN 2019

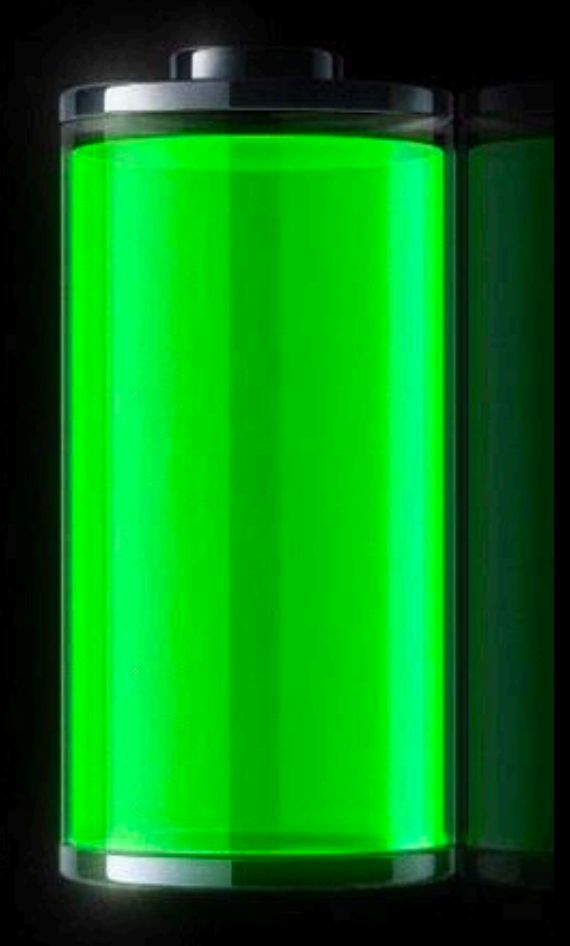
TESLA BATTERY DAY - 2020

- **Holy Grail: <\$100/KW hr (a \$25K Tesla)**
- **Fossil Fuel will go away**
- **>500 Mile Range**



AUTOMOTIVE INDUSTRY COMMITS >\$300 BILLION ON EVs

- **Toyota** & Panasonic are teaming up on batteries
- **BMW** is teaming up with solid-state battery developer Solid Power
- **Porsche** & BMW are collaborating on ultra-fast electric car charge in 15 min
- **Volkswagen** has invested in stealth battery startup QuantumScape





META-TREND



META-TREND

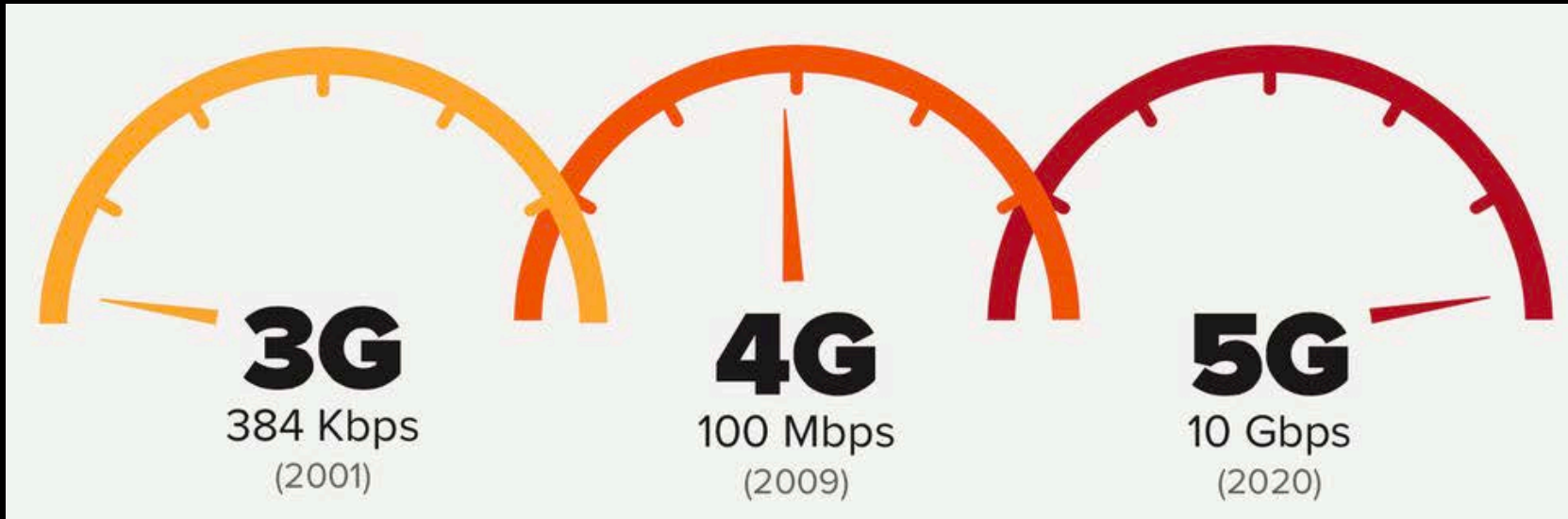
**"EVERYONE" IS CONNECTED
AT GIGABIT SPEED**

Everyone, everywhere, at ultra-low cost.

"Connecting the Globe..."

THE 5G WORLD

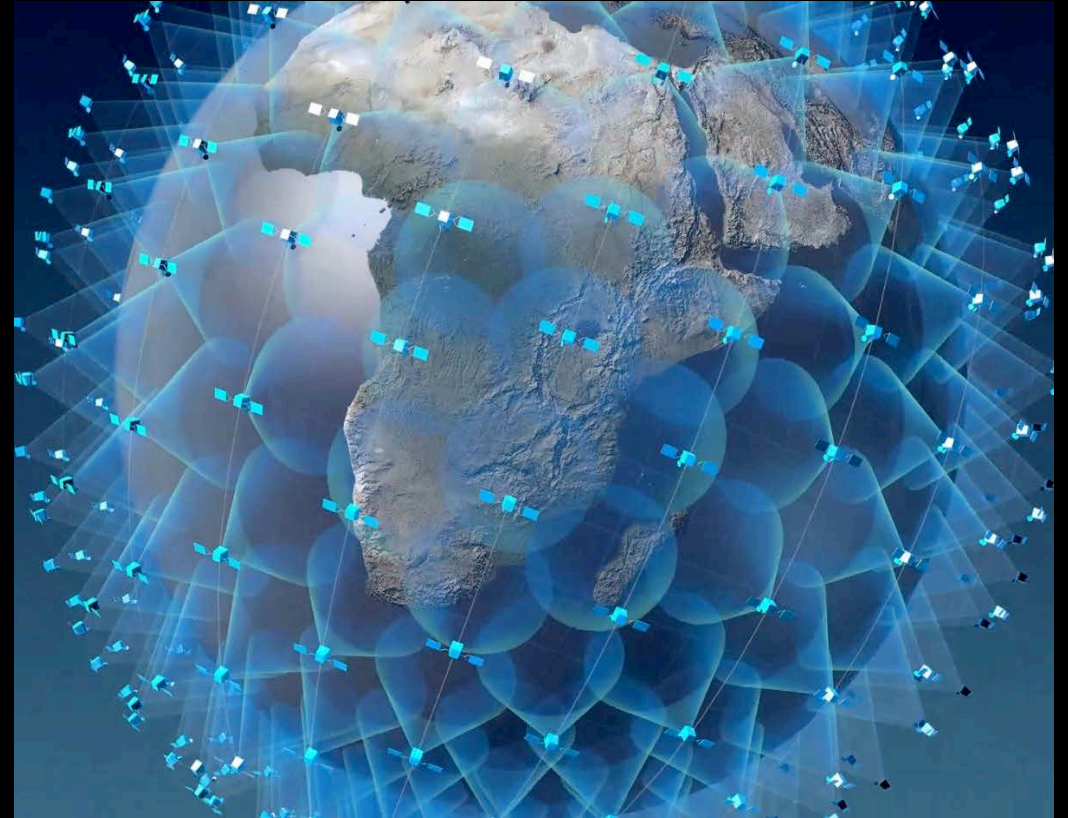
1. Testing in 2019
2. Deployment in 2020
3. 10 - 100 Gbps speeds



SPACEX LAUNCHING 12,000+ **STARLINK** **INTERNET SATELLITES** (up to 42,000)

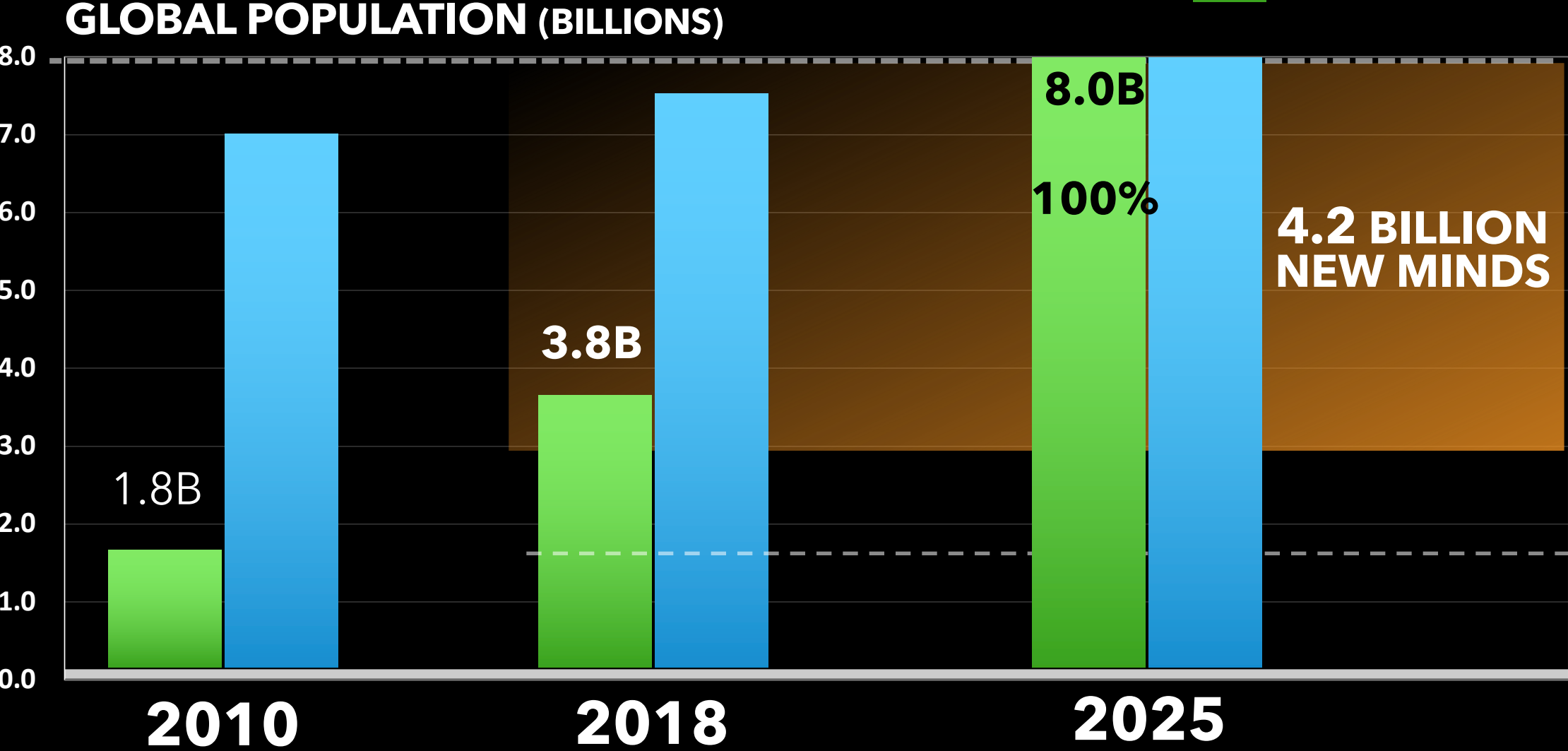


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GLOBAL UBIQUITOUS CONNECTIVITY

Global Population
Internet Users



What will 4+ Billion New Minds...

create

discover

consume

desire

invent

...Tens of trillions of annual PP

...Greatest period of Innovation (ever)



META-TREND

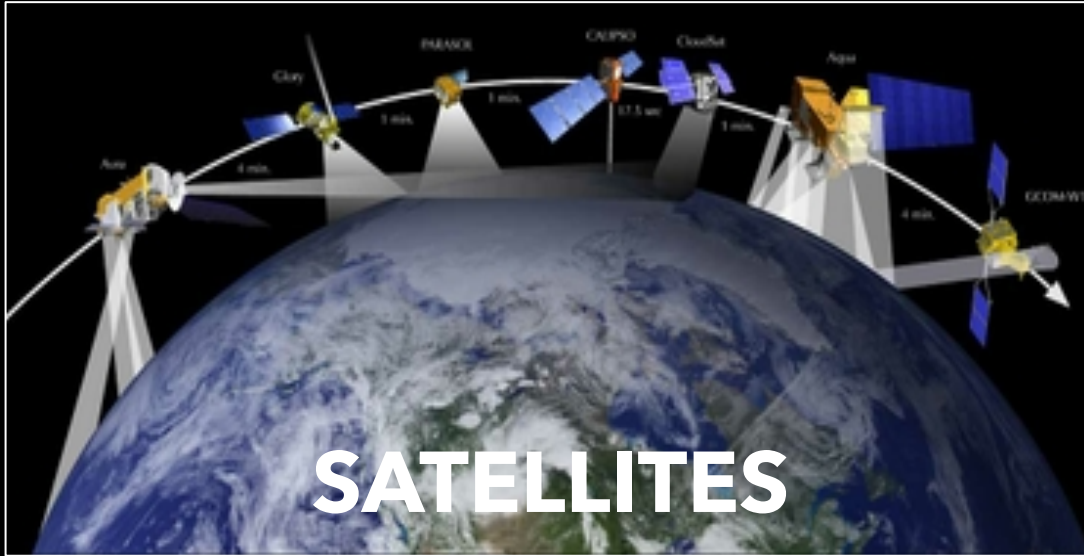
**“EVERYTHING” IS
CONNECTED/
SENSORS EVERYWHERE**

It's not just people being connected, we are connecting everything, everywhere...

2020: 20B+ connected devices & **>1 Trillion Sensors**

2030: 500B+ connected devices & **>100 Trillion Sensors**

An Explosion of Data



Data-Driven A.I.

"We are heading toward a "future of perfect knowledge"... where ***you can know anything you want, anytime, anywhere.....***"

"We're heading towards a decade of powerful data-driven AI."

"It's more important the Questions You Ask... vs. what you know."

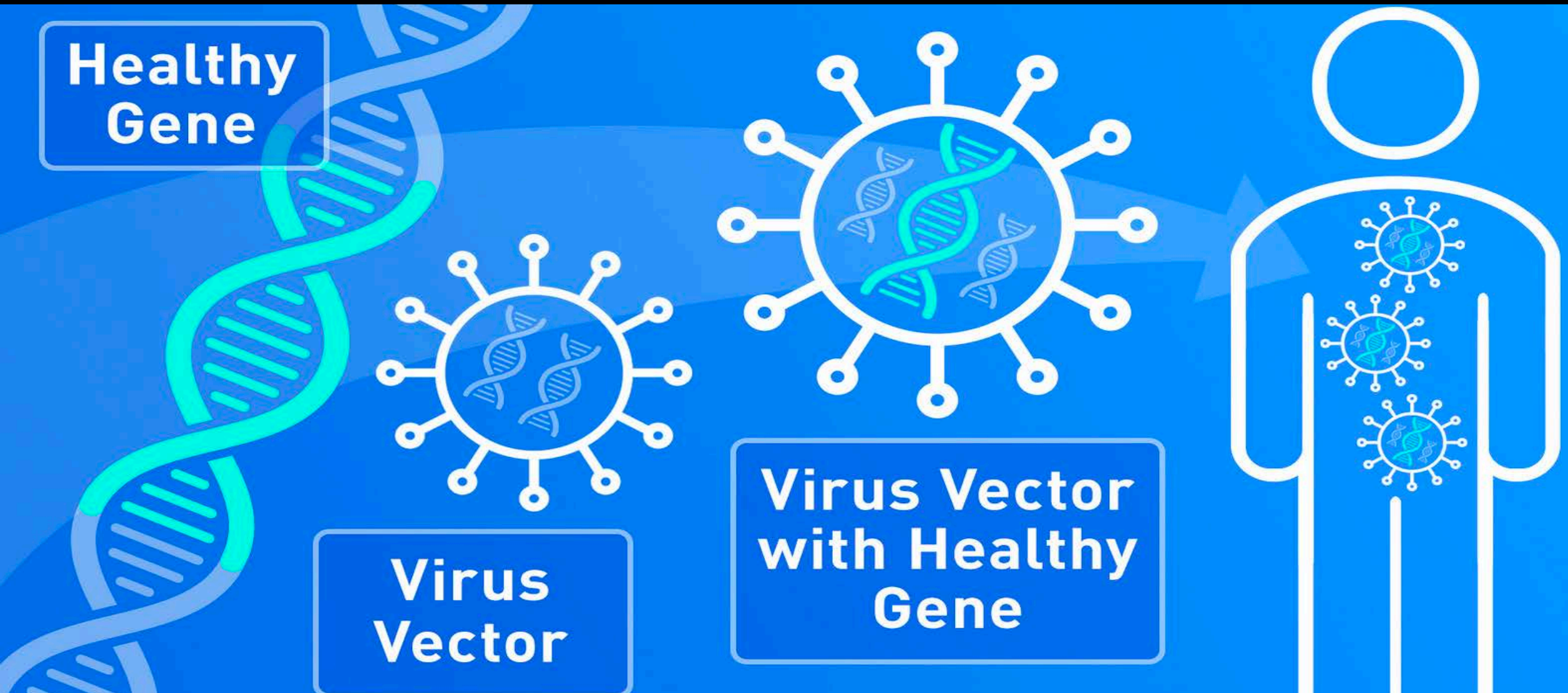
A white and blue humanoid robot, likely a Boston Dynamics model, is shown in a dark, industrial setting. The robot is standing and facing forward, with its arms slightly away from its body. The text "Boston Dynamics" is visible on its chest. The background is dark and out of focus, showing some structural elements of a facility.

META-TREND

HEALTH & BIOTECH

20 Gene Therapy Treatments Approved...

>400 Trials On-Going.



PRIME EDITING: A NEW DNA EDITING TOOL WITH THE POTENTIAL TO CORRECT **89%** OF GENETIC DEFECTS



*"You can think of **prime editors to be like word processors**, capable of searching for target DNA sequences and precisely replacing them...."*

- Dr David Liu, Broad, MIT



META-TREND

**INCREASING HUMAN
LONGEVITY &
HEALTHSPAN**

"Making 100 Years old, the new 60"

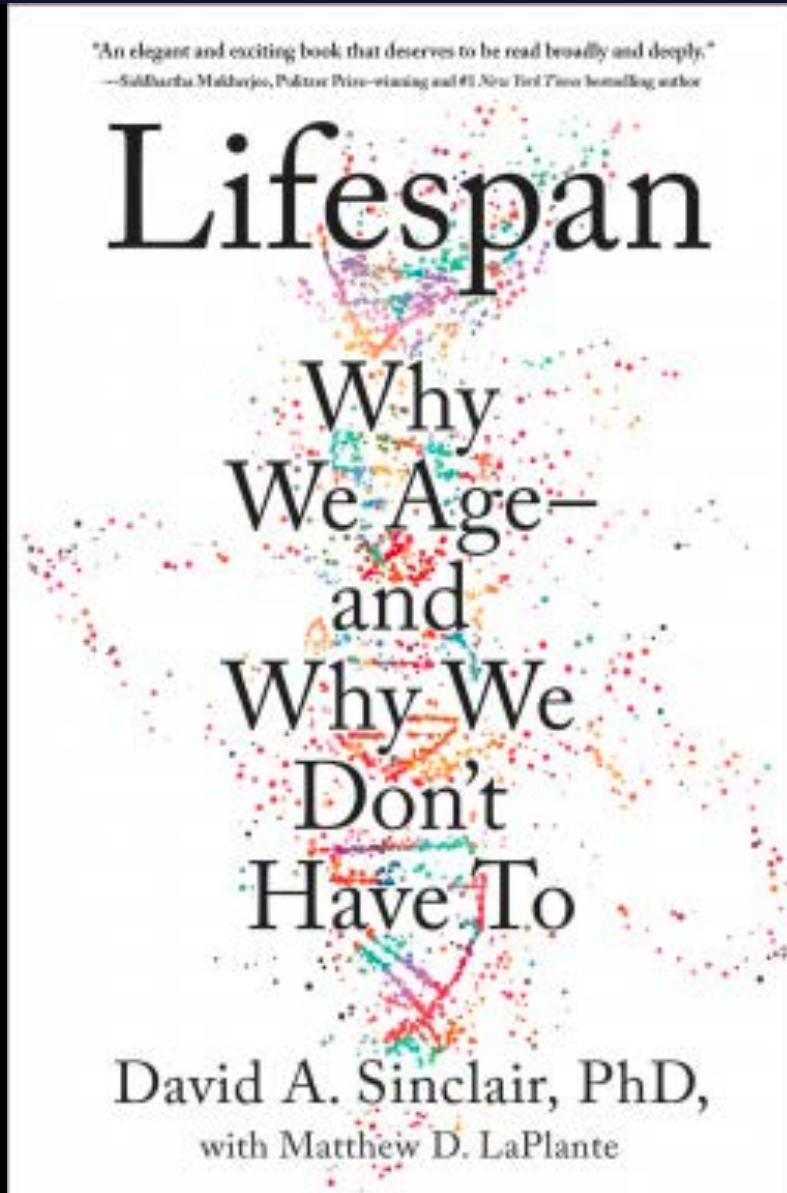


"Making 100 Years old, the new 60"



- **Advanced Diagnostics** (HLI)
- **Stem Cells** (Celularity & Fountain)
- **NAD+** (Harvard University)
- **Senolytic Medicines** (Unity Bio)
- **wnt Pathway** (Samumed)
- **New Organs** (UnitedTherapeutics)
- **mRNA** (Moderna)
- **Vaccines** (United Neurosciences)
- **GDF-11** (Elevian)
- **CrispR/Gene Therapy** (Editas)
- **wnt Pathway** (Samumed)

Dr. DAVID SINCLAIR: INFO THEORY OF AGING



Dr. David Sinclair, reveals a bold new theory for why we age: "The Information Theory of Aging".

"Aging is a disease, and that disease is treatable."

- David Sinclair, PhD



META-TREND

ARTIFICIAL INTELLIGENCE

“Artificial intelligence could have more profound implications for humanity than electricity or fire.”

- *Sundar Pichai, CEO, Alphabet*





“Companies have to race to build AI or they will be made uncompetitive. Essentially, if your competitor is racing to build AI, they will crush you.”

- Elon Musk

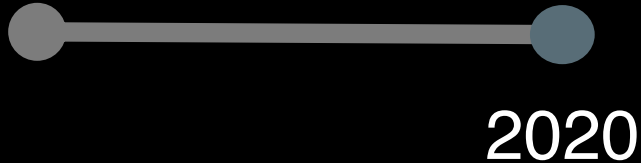
MY THOUGHTS....

“There will be two kinds of companies at the end of this decade....

...those who are using AI.

...and those who are out of business.”

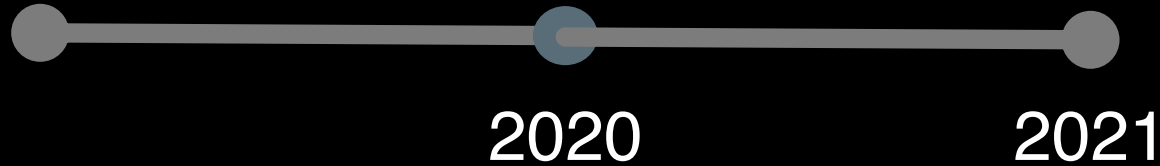
POTENTIAL OF AI



AI-driven companies will take \$1.2 trillion from competitors by 2020.

Forrester Predictions:
Artificial Intelligence Will Drive The Insights Revolution

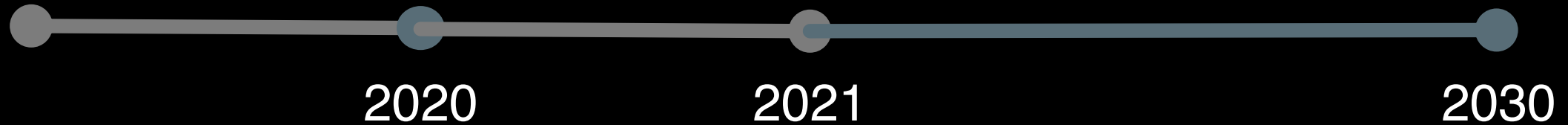
POTENTIAL OF AI



AI will generate **\$2.9 trillion** in business value and recover 6.2 billion hours of worker productivity by **2021**.

- Gartner Predictions (Forbes)

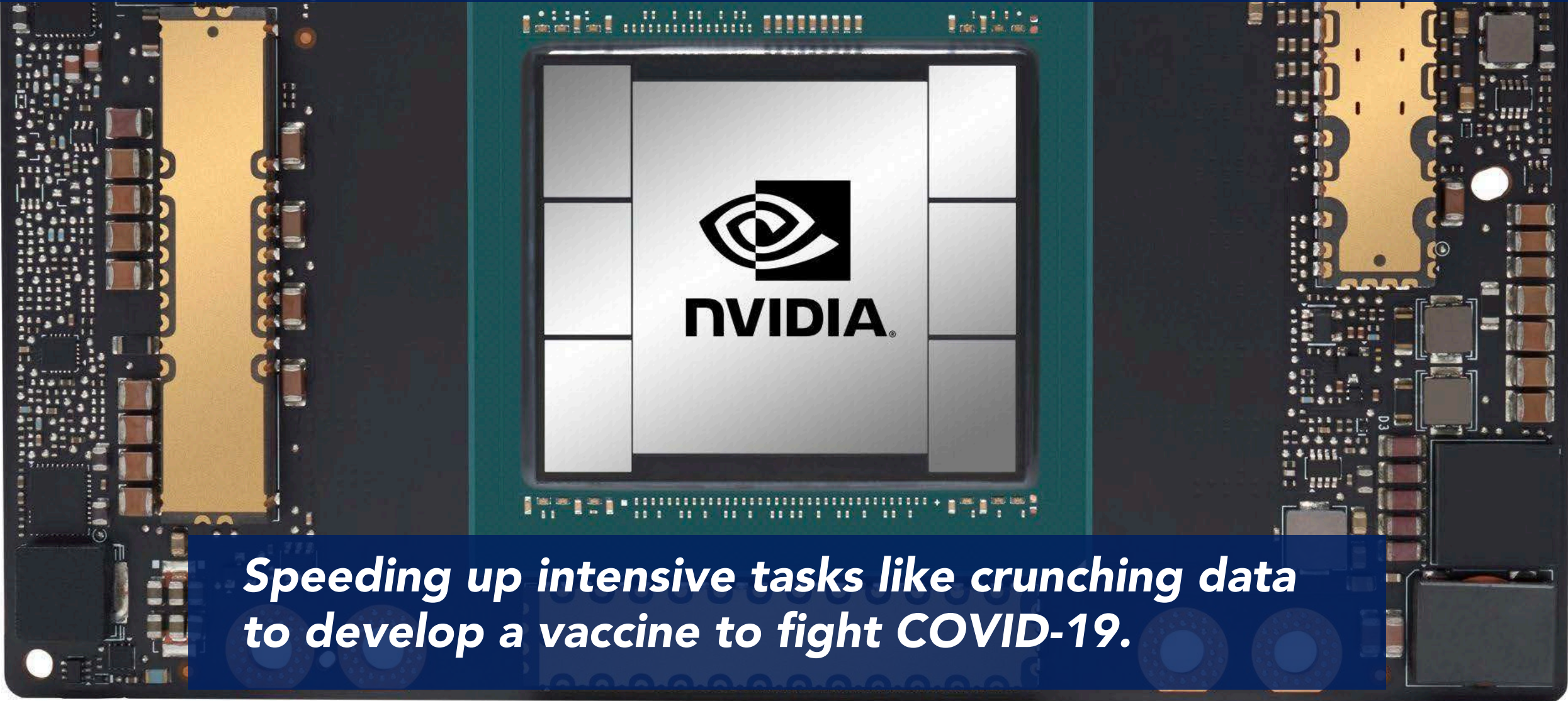
POTENTIAL OF AI



By **2030**, the potential contribution to the economy from Artificial Intelligence will be **\$15.7 trillion**, and global GDP could increase by 14% as a result of AI.

- PwC Global Estimates

Nvidia's new data center A100 GPU packs **20 times the performance** of its predecessor



Speeding up intensive tasks like crunching data to develop a vaccine to fight COVID-19.

**"AI will reach human level
intelligence by 2029."**

Ray Kurzweil, Google, Singularity Univ.

AI WILL DRIVE STARSHIP AUTONOMOUS DELIVERY ROBOTS ON COLLEGE CAMPUSES



- Each on-demand delivery costs only **\$2.00**
- **100+ Universities** to be added within 24 months

AI WILL PILOT AMAZON PRIME DRONE DELIVERIES



FAA issued AMAZON PRIME AIR "Part 135 air carrier certificate" allowing it to begin commercial drone deliveries in the US.

WAYMO BECOMES 1st AUTONOMOUS CAR ON ROAD **WITHOUT SAFETY DRIVER** (25 Cities)



WAYMO 01

WAYMO: Driven >10 million miles in the real world
>10 billion miles in *simulation*

FLYING CARS ARE HERE

150 Startups / >\$1 Billion per year



JOBY RAISES \$590M (TOYOTA) - AIRTAXI SERVICE

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AI (LAWGEEX) BEATS HUMAN LAWYERS IN CONTRACT READING COMPETITION

Humans vs. AI in reading a contract:

- **Humans: 92 min, 85% accuracy**
- **AI: 26 seconds, 94% accuracy**

**The decade ahead is about
"Human-AI Collaboration."**

**Your mission is to "automate
the routine", and "humanize
the exceptional."**

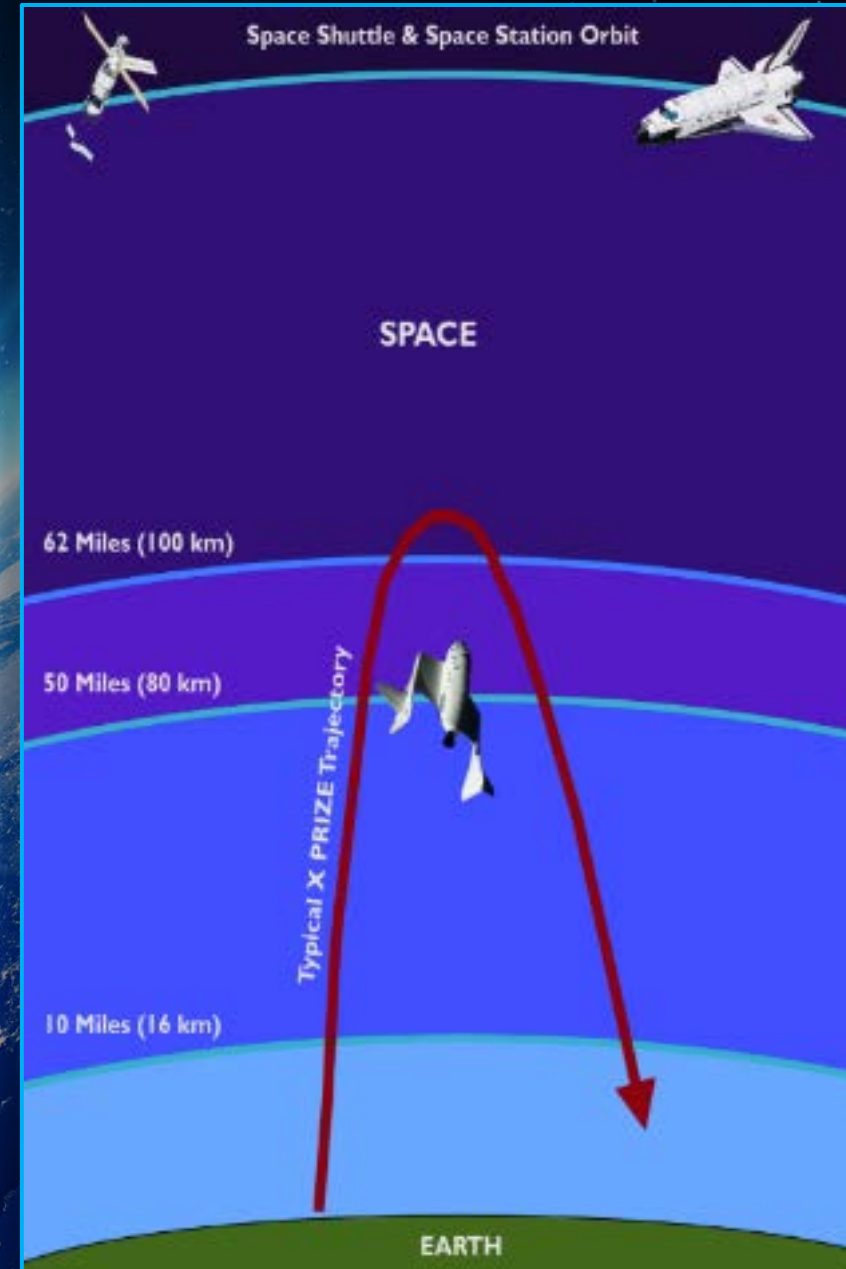


META-TREND

**SMALL TEAMS CAN
SOLVE BIG PROBLEMS**

XPRIZE COMPETITIONS

- \$10 million purse
- Privately funded teams
- 3 person crew
- 100 km altitude
- Two flights within 2 weeks



WINNING THE ANSARI X PRIZE



ARCA



Space Transport

- 26 Teams
- From 7 Nations
- Spending > \$100 million



DaVinci Project



Canadian Arrow



Rocketplane



Armadillo Aerospace



StarChaser



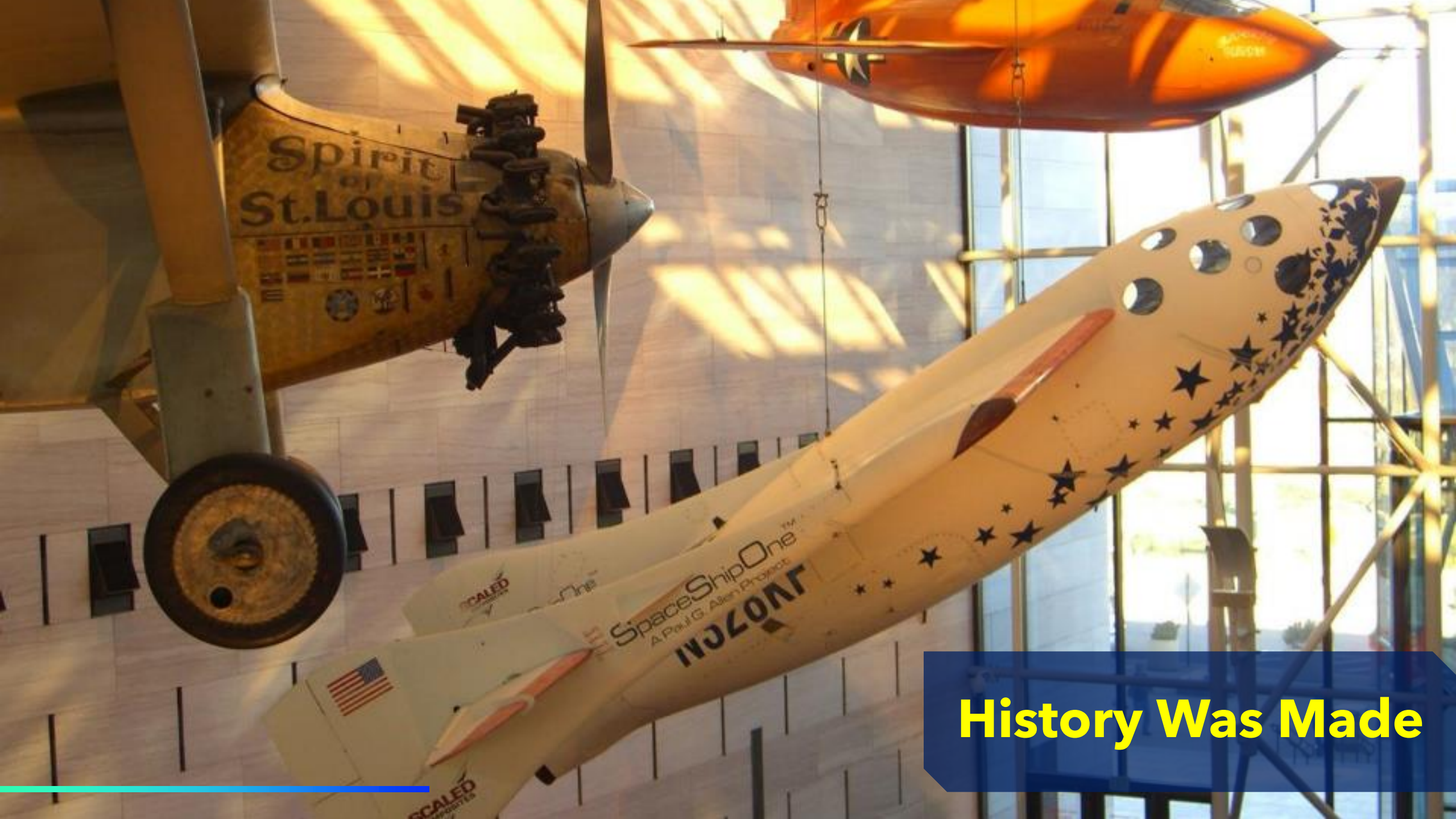
Pablo DeLeon



Scaled Composites



October 4th, 2004
Mojave Desert



History Was Made





PRIZE SUMMARY



AWARDED & ACTIVE

>\$150M



UNDER DEVELOPMENT

\$200M+

GLOBAL
LEARNING

XPRIZE®

- **\$15 Million** Purse (Elon Musk + Tony Robbins)
- Teach reading, writing & math in 15 months.
- 700+ teams entered
- 2500 Children in Tanzania
- \$300 Million spent to win the \$15M Purse
- 1 Hour of Tablet Use = Full-time school



- **\$1.5 Million** Purse
- Extract 2,000 liters of water per day from the atmosphere
- Using 100% renewable energy
- Cost <2 cents per liter
- 98 teams (25 countries)
- Awarded October 2018

Sponsor: TATA GROUP & AUSTRALIAN AID

ANA AVATAR XPRIZE®



- **\$10 Million** Prize Purse
- Transmit your Senses & action to a Robotic Avatar.
- Disaster relief, health assistance
- 70+ Teams from 15 countries

Sponsor: ALL NIPPON AIRWAYS (ANA)

FEEDING THE NEXT BILLION **XPRIZE**[®]



- **\$15 Million** Prize Purse
- Create a new generation of "stem-cell" and "plant-derived" Poultry & Fish.
- Cheaper, Healthier & Tastier
- For 1 Billion+ People

Sponsor: Tony Robbins, Abu Dhabi



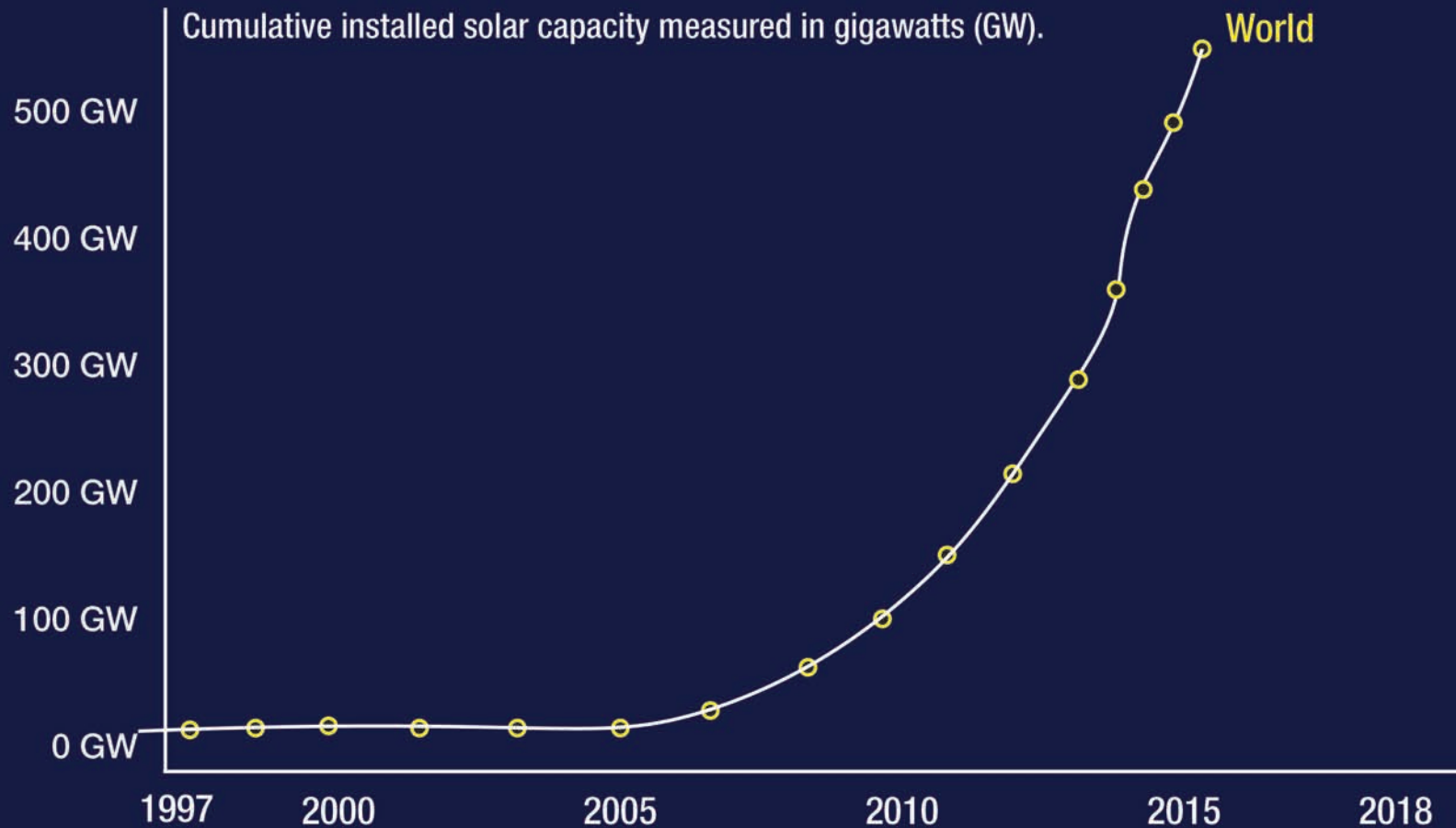
"ABUNDANCE MINDSET"

A DECADE OF ABUNDANCE

2010 - 2020

RENEWABLE ENERGY

10X SOLAR ENERGY CAPACITY

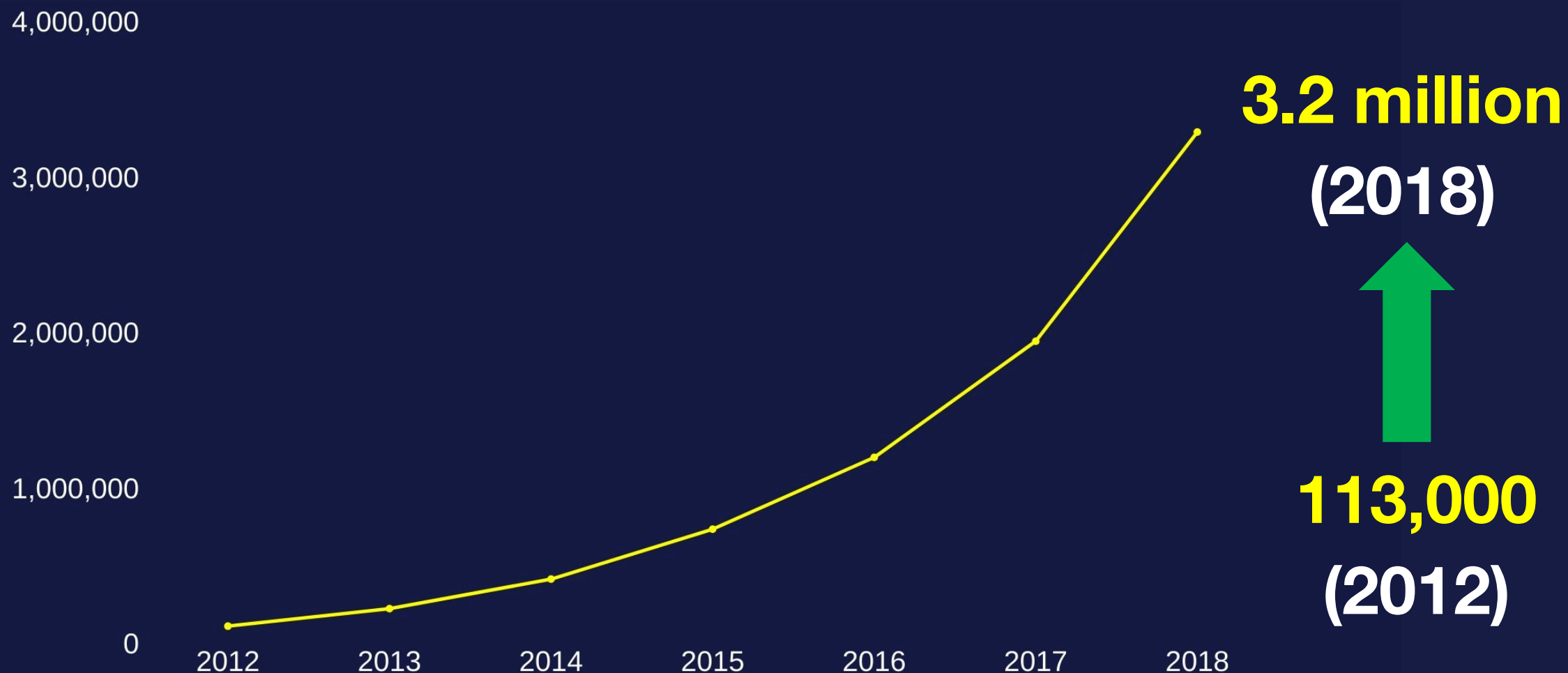


565 Gigawatts
(2018)



40 Gigawatts
(2010)

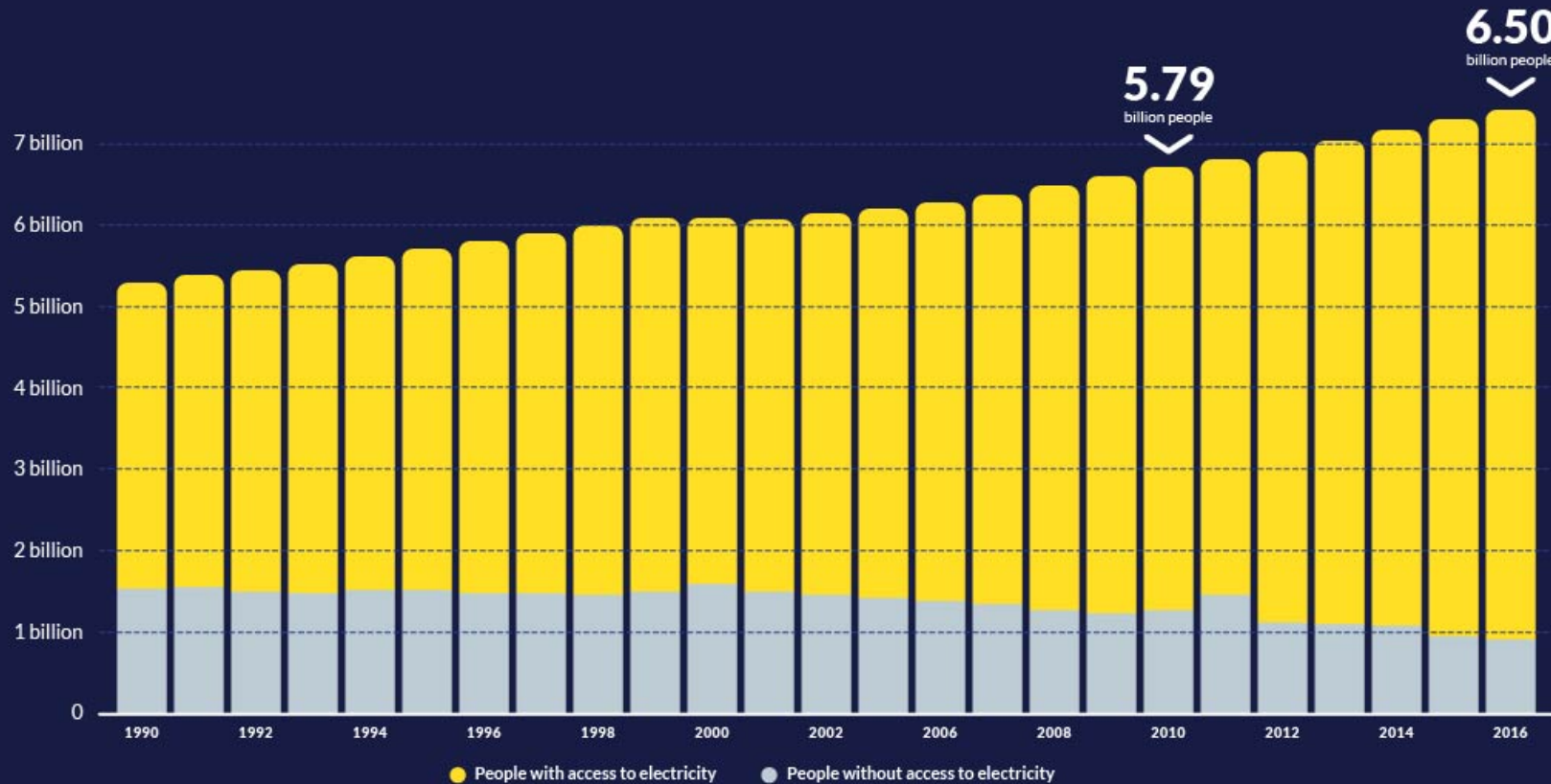
30X MORE BATTERY ELECTRIC VEHICLES ON THE ROAD



Source: Statista, IEA.org

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700 MILLION MORE PEOPLE HAVE ACCESS TO ELECTRICITY



6.5 B (2016)



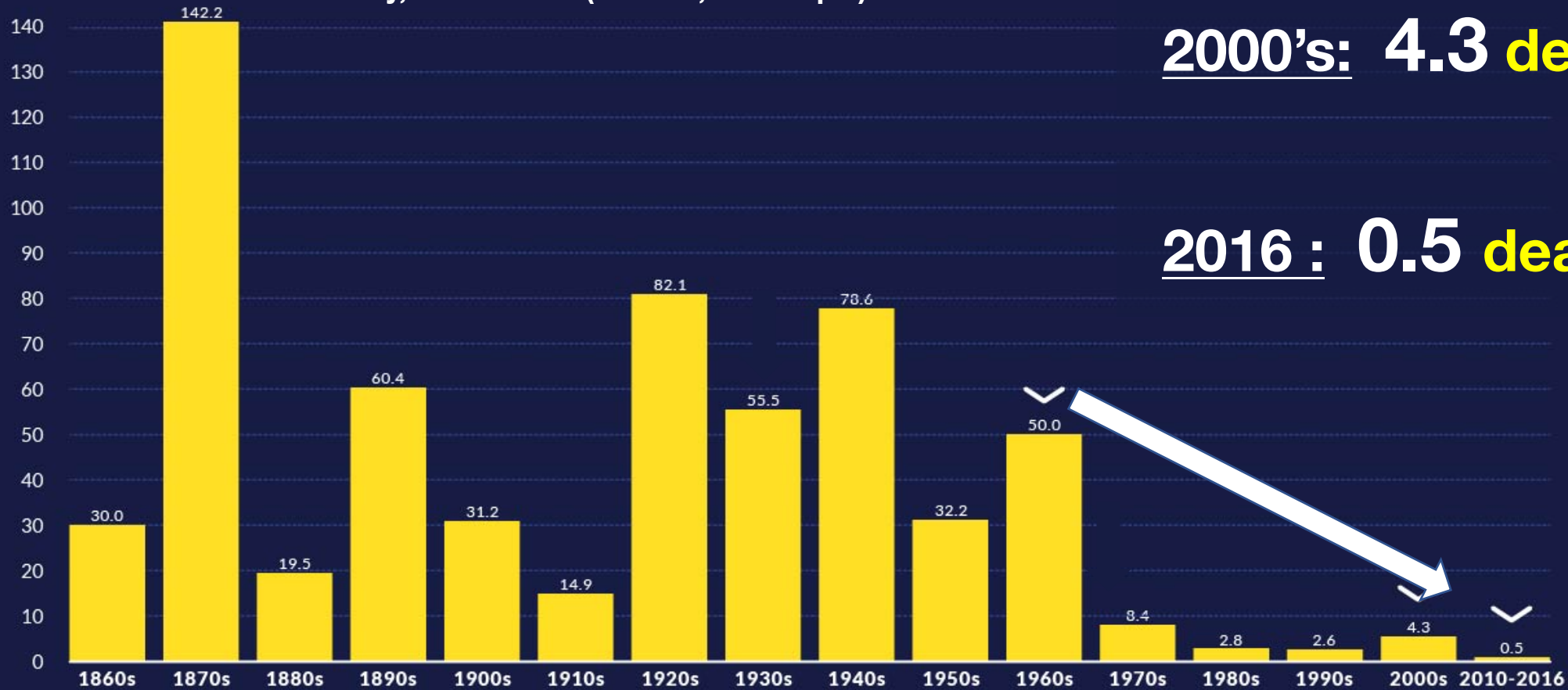
5.79 B (2010)

Source: The World Bank, Our World In Data

FAMINE

9X LESS PEOPLE DIED FROM FAMINE

Annual Rate Of People Dying Due To A Famine
Globally, Per Decade (Per 100,000 People)



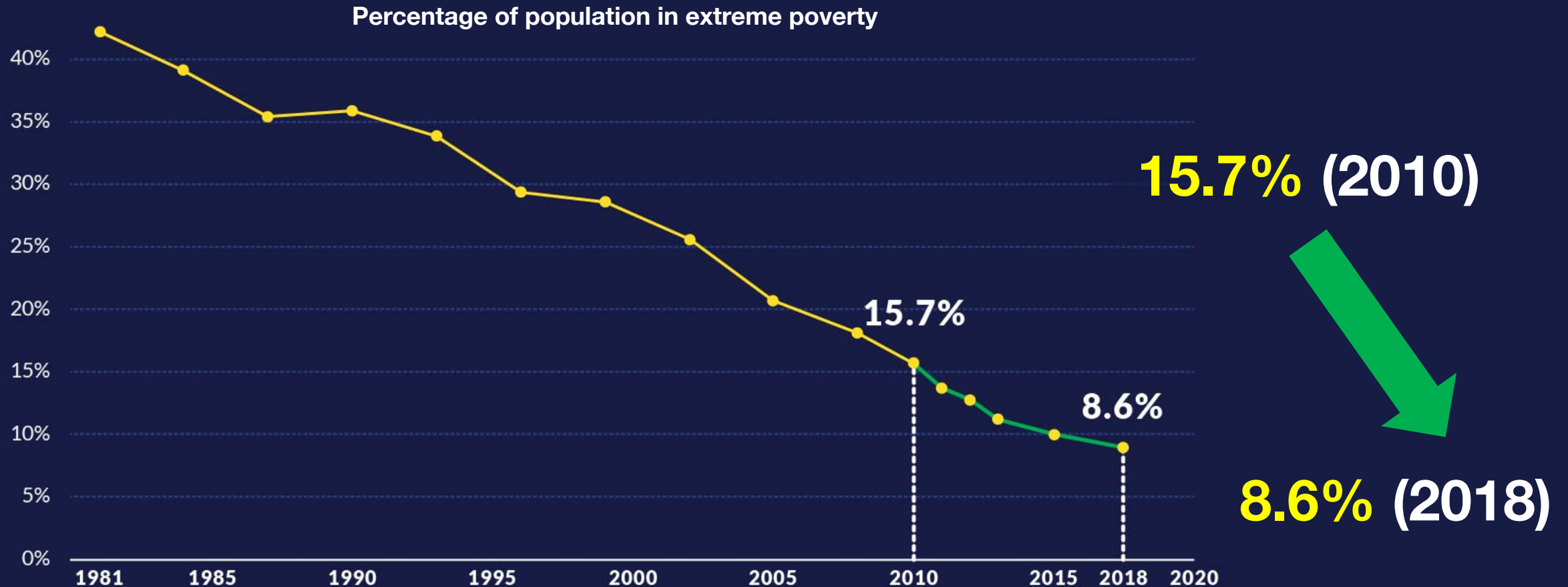
2000's: 4.3 deaths/100K

2016: 0.5 deaths/100K

Source: Our World In Data

EXTREME POVERTY

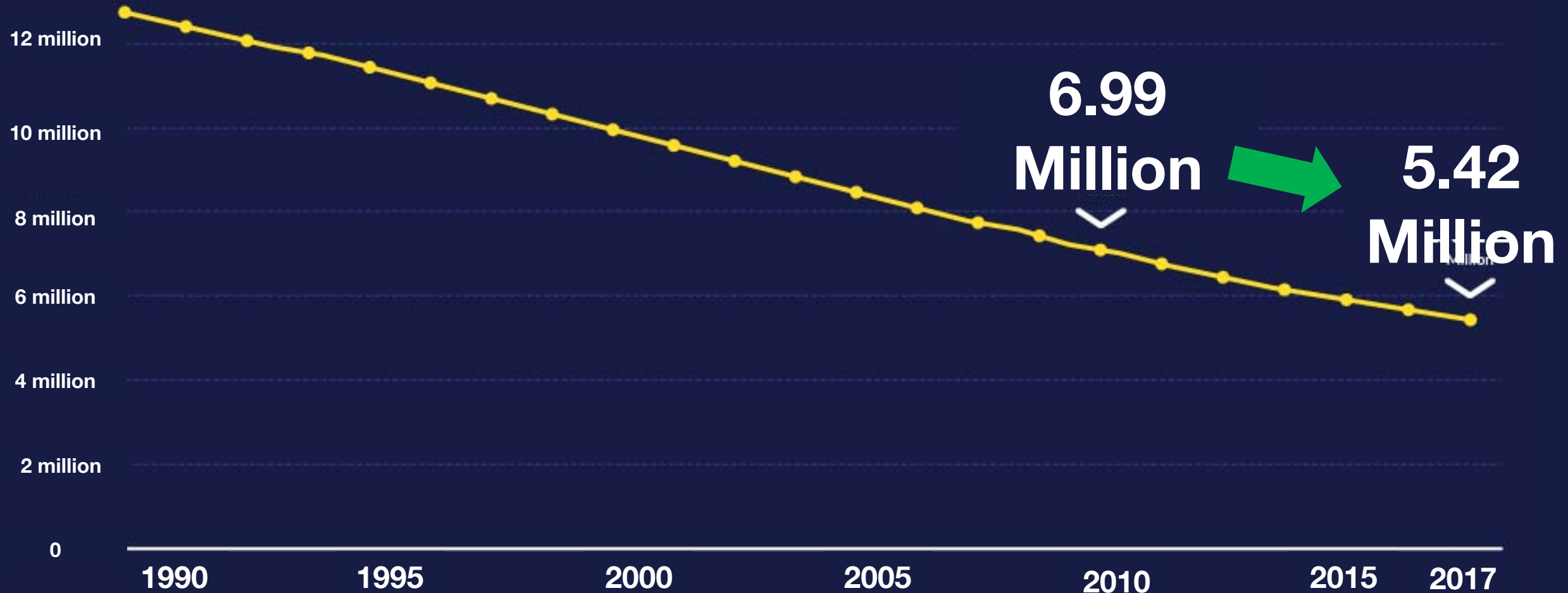
SINCE 2010, WE CUT GLOBAL EXTREME POVERTY IN HALF



Source: World Bank, Our World In Data

CHILD MORTALITY

22% DECLINE IN CHILD MORTALITY (under age 5)



Source: United Nations, Our World In Data



Final Abundance Thought...

**"A negative mind will never
give you a positive life."**



Final Abundance Thought...

"The World's Biggest Problems are the World's Biggest Opportunities."

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AN EMAIL TO:**

keynote@diamandis.com

www.abundance360.com

www.SingularityU.org

www.xprize.org